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| (51) International Patent Classification ⁷ : C12N 15/12, C07K 14/47, C12Q 1/68, A61K 39/395, G01N 33/68, 33/574, C07K 16/30, C12N 15/62, 5/02 // A61P 35/00 | A2 | (11) International Publication Number: WO 00/04149 (43) International Publication Date: 27 January 2000 (27.01.00) | | | | | | | | | | | | | | | | | | | | | |
| (21) International Application Number: PCT/US99/15838 (22) International Filing Date: 14 July 1999 (14.07.99) (30) Priority Data: <table border="0"> <tr> <td>09/115,453</td> <td>14 July 1998 (14.07.98)</td> <td>US</td> </tr> <tr> <td>09/116,134</td> <td>14 July 1998 (14.07.98)</td> <td>US</td> </tr> <tr> <td>09/159,822</td> <td>23 September 1998 (23.09.98)</td> <td>US</td> </tr> <tr> <td>09/159,812</td> <td>23 September 1998 (23.09.98)</td> <td>US</td> </tr> <tr> <td>09/232,880</td> <td>15 January 1999 (15.01.99)</td> <td>US</td> </tr> <tr> <td>09/232,149</td> <td>15 January 1999 (15.01.99)</td> <td>US</td> </tr> <tr> <td>09/288,946</td> <td>9 April 1999 (09.04.99)</td> <td>US</td> </tr> </table> (71) Applicant: CORIXA CORPORATION [US/US]; Suite 200, 1124 Columbia Street, Seattle, WA 98104 (US). (72) Inventors: DILLON, Davin, Clifford; 21607 N.E. 24th Street, Redmond, WA 98053 (US). HARLOCKER, Susan, Louise; 6203 20th Avenue N.W., Seattle, WA 98107 (US). YUQIU, Jiang; 5001 South 232nd Street, Kent, WA 98032 (US). XU, Jiangchun; 15805 S.E. 43rd Place, Bellevue, WA 98006 (US). MITCHAM, Jennifer, Lynn; 16677 Northeast 88th Street, Redmond, WA 98052 (US). | | 09/115,453 | 14 July 1998 (14.07.98) | US | 09/116,134 | 14 July 1998 (14.07.98) | US | 09/159,822 | 23 September 1998 (23.09.98) | US | 09/159,812 | 23 September 1998 (23.09.98) | US | 09/232,880 | 15 January 1999 (15.01.99) | US | 09/232,149 | 15 January 1999 (15.01.99) | US | 09/288,946 | 9 April 1999 (09.04.99) | US | (74) Agents: MAKI, David, J. et al.; Seed and Berry LLP, 6300 Columbia, 701 Fifth Avenue, Seattle, WA 98104-7092 (US). (81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i> |
| 09/115,453 | 14 July 1998 (14.07.98) | US | | | | | | | | | | | | | | | | | | | | | |
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| 09/288,946 | 9 April 1999 (09.04.99) | US | | | | | | | | | | | | | | | | | | | | | |
| (54) Title: COMPOSITIONS AND METHODS FOR THERAPY AND DIAGNOSIS OF PROSTATE CANCER (57) Abstract <p>Compositions and methods for the therapy and diagnosis of cancer, such as prostate cancer, are disclosed. Compositions may comprise one or more prostate tumor proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a prostate tumor protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as prostate cancer. Diagnostic methods based on detecting a prostate tumor protein, or mRNA encoding such a protein, in a sample are also provided.</p> | | | | | | | | | | | | | | | | | | | | | | | |

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COMPOSITIONS AND METHODS FOR THERAPY AND DIAGNOSIS OF PROSTATE CANCER

TECHNICAL FIELD

The present invention relates generally to therapy and diagnosis of cancer, such as prostate cancer. The invention is more specifically related to polypeptides comprising at least a portion of a prostate tumor protein, and to polynucleotides encoding such polypeptides. Such polypeptides and polynucleotides may be used in vaccines and pharmaceutical compositions for prevention and treatment of prostate cancer, and for the diagnosis and monitoring of such cancers.

BACKGROUND OF THE INVENTION

Prostate cancer is the most common form of cancer among males, with an estimated incidence of 30% in men over the age of 50. Overwhelming clinical evidence shows that human prostate cancer has the propensity to metastasize to bone, and the disease appears to progress inevitably from androgen dependent to androgen refractory status, leading to increased patient mortality. This prevalent disease is currently the second leading cause of cancer death among men in the U.S.

In spite of considerable research into therapies for the disease, prostate cancer remains difficult to treat. Commonly, treatment is based on surgery and/or radiation therapy, but these methods are ineffective in a significant percentage of cases. Two previously identified prostate specific proteins - prostate specific antigen (PSA) and prostatic acid phosphatase (PAP) - have limited therapeutic and diagnostic potential. For example, PSA levels do not always correlate well with the presence of prostate cancer, being positive in a percentage of non-prostate cancer cases, including benign prostatic hyperplasia (BPH). Furthermore, PSA measurements correlate with prostate volume, and do not indicate the level of metastasis.

In spite of considerable research into therapies for these and other cancers, prostate cancer remains difficult to diagnose and treat effectively. Accordingly, there is a need in the art for improved methods for detecting and treating such cancers. The present invention fulfills these needs and further provides other related advantages.

SUMMARY OF THE INVENTION

Briefly stated, the present invention provides compositions and methods for the diagnosis and therapy of cancer, such as prostate cancer. In one aspect, the present

invention provides polypeptides comprising at least a portion of a prostate tumor protein, or a variant thereof. Certain portions and other variants are immunogenic, such that the ability of the variant to react with antigen-specific antisera is not substantially diminished. Within certain embodiments, the polypeptide comprises at least an immunogenic portion of a prostate tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of: (a) sequences recited in any one of SEQ ID NOs:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 or 384-472; (b) sequences that hybridize to any of the foregoing sequences under moderately stringent conditions; and (c) complements of any of the sequence of (a) or (b). In certain specific embodiments, such a polypeptide comprises at least a portion, or variant thereof, of a tumor protein that includes an amino acid sequence selected from the group consisting of sequences recited in any one of SEQ ID NO: 112-114, 172, 176, 178, 327, 329, 331, 336, 339, 376-380 and 383.

The present invention further provides polynucleotides that encode a polypeptide as described above, or a portion thereof (such as a portion encoding at least 15 amino acid residues of a prostate tumor protein), expression vectors comprising such polynucleotides and host cells transformed or transfected with such expression vectors.

Within other aspects, the present invention provides pharmaceutical compositions comprising a polypeptide or polynucleotide as described above and a physiologically acceptable carrier.

Within a related aspect of the present invention, vaccines are provided. Such vaccines comprise a polypeptide or polynucleotide as described above and a non-specific immune response enhancer.

The present invention further provides pharmaceutical compositions that comprise: (a) an antibody or antigen-binding fragment thereof that specifically binds to a prostate tumor protein; and (b) a physiologically acceptable carrier.

Within further aspects, the present invention provides pharmaceutical compositions comprising: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) a pharmaceutically acceptable carrier or excipient. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B cells.

Within related aspects, vaccines are provided that comprise: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) a non-specific immune response enhancer.

The present invention further provides, in other aspects, fusion proteins that comprise at least one polypeptide as described above, as well as polynucleotides encoding such fusion proteins.

Within related aspects, pharmaceutical compositions comprising a fusion protein, or a polynucleotide encoding a fusion protein, in combination with a physiologically acceptable carrier are provided.

Vaccines are further provided, within other aspects, that comprise a fusion protein, or a polynucleotide encoding a fusion protein, in combination with a non-specific immune response enhancer.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient a pharmaceutical composition or vaccine as recited above.

The present invention further provides, within other aspects, methods for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a prostate tumor protein, wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the protein from the sample.

Within related aspects, methods are provided for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated as described above.

Methods are further provided, within other aspects, for stimulating and/or expanding T cells specific for a prostate tumor protein, comprising contacting T cells with one or more of: (i) a polypeptide as described above; (ii) a polynucleotide encoding such a polypeptide; and/or (iii) an antigen presenting cell that expresses such a polypeptide; under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells. Isolated T cell populations comprising T cells prepared as described above are also provided.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population as described above.

The present invention further provides methods for inhibiting the development of a cancer in a patient, comprising the steps of: (a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with one or more of: (i) a polypeptide comprising at least an immunogenic portion of a prostate tumor protein; (ii) a polynucleotide encoding such a polypeptide; and (iii) an antigen-presenting cell that expressed such a polypeptide; and (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient. Proliferated cells may, but need not, be cloned prior to administration to the patient.

Within further aspects, the present invention provides methods for determining the presence or absence of a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that binds to a polypeptide as recited

above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and (c) comparing the amount of polypeptide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within preferred embodiments, the binding agent is an antibody, more preferably a monoclonal antibody. The cancer may be prostate cancer.

The present invention also provides, within other aspects, methods for monitoring the progression of a cancer in a patient. Such methods comprise the steps of: (a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polypeptide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

The present invention further provides, within other aspects, methods for determining the presence or absence of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a prostate tumor protein; (b) detecting in the sample a level of a polynucleotide, preferably mRNA, that hybridizes to the oligonucleotide; and (c) comparing the level of polynucleotide that hybridizes to the oligonucleotide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within certain embodiments, the amount of mRNA is detected via polymerase chain reaction using, for example, at least one oligonucleotide primer that hybridizes to a polynucleotide encoding a polypeptide as recited above, or a complement of such a polynucleotide. Within other embodiments, the amount of mRNA is detected using a hybridization technique, employing an oligonucleotide probe that hybridizes to a polynucleotide that encodes a polypeptide as recited above, or a complement of such a polynucleotide.

In related aspects, methods are provided for monitoring the progression of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a prostate tumor protein; (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polynucleotide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

Within further aspects, the present invention provides antibodies, such as monoclonal antibodies, that bind to a polypeptide as described above, as well as diagnostic

kits comprising such antibodies. Diagnostic kits comprising one or more oligonucleotide probes or primers as described above are also provided.

These and other aspects of the present invention will become apparent upon reference to the following detailed description and attached drawings. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

BRIEF DESCRIPTION OF THE DRAWINGS AND SEQUENCE IDENTIFIERS

Figure 1 illustrates the ability of T cells to kill fibroblasts expressing the representative prostate tumor polypeptide P502S, as compared to control fibroblasts. The percentage lysis is shown as a series of effector:target ratios, as indicated.

Figures 2A and 2B illustrate the ability of T cells to recognize cells expressing the representative prostate tumor polypeptide P502S. In each case, the number of γ -interferon spots is shown for different numbers of responders. In Figure 2A, data is presented for fibroblasts pulsed with the P2S-12 peptide, as compared to fibroblasts pulsed with a control E75 peptide. In Figure 2B, data is presented for fibroblasts expressing P502S, as compared to fibroblasts expressing HER-2/*neu*.

Figure 3 represents a peptide competition binding assay showing that the P1S#10 peptide, derived from P501S, binds HLA-A2. Peptide P1S#10 inhibits HLA-A2 restricted presentation of fluM58 peptide to CTL clone D150M58 in TNF release bioassay. D150M58 CTL is specific for the HLA-A2 binding influenza matrix peptide fluM58.

Figure 4 illustrates the ability of T cell lines generated from P1S#10 immunized mice to specifically lyse P1S#10-pulsed Jurkat A2Kb targets and P501S-transduced Jurkat A2Kb targets, as compared to EGFP-transduced Jurkat A2Kb. The percent lysis is shown as a series of effector to target ratios, as indicated.

Figure 5 illustrates the ability of a T cell clone to recognize and specifically lyse Jurkat A2Kb cells expressing the representative prostate tumor polypeptide P501S, thereby demonstrating that the P1S#10 peptide may be a naturally processed epitope of the P501S polypeptide.

Figures 6A and 6B are graphs illustrating the specificity of a CD8⁺ cell line (3A-1) for a representative prostate tumor antigen (P501S). Figure 6A shows the results of a ⁵¹Cr release assay. The percent specific lysis is shown as a series of effector:target ratios, as indicated. Figure 6B shows the production of interferon-gamma by 3A-1 cells stimulated with autologous B-LCL transduced with P501S, at varying effector:target ratios as indicated.

SEQ ID NO: 1 is the determined cDNA sequence for F1-13

SEQ ID NO: 2 is the determined 3' cDNA sequence for F1-12

SEQ ID NO: 3 is the determined 5' cDNA sequence for F1-12
SEQ ID NO: 4 is the determined 3' cDNA sequence for F1-16
SEQ ID NO: 5 is the determined 3' cDNA sequence for H1-1
SEQ ID NO: 6 is the determined 3' cDNA sequence for H1-9
SEQ ID NO: 7 is the determined 3' cDNA sequence for H1-4
SEQ ID NO: 8 is the determined 3' cDNA sequence for J1-17
SEQ ID NO: 9 is the determined 5' cDNA sequence for J1-17
SEQ ID NO: 10 is the determined 3' cDNA sequence for L1-12
SEQ ID NO: 11 is the determined 5' cDNA sequence for L1-12
SEQ ID NO: 12 is the determined 3' cDNA sequence for N1-1862
SEQ ID NO: 13 is the determined 5' cDNA sequence for N1-1862
SEQ ID NO: 14 is the determined 3' cDNA sequence for J1-13
SEQ ID NO: 15 is the determined 5' cDNA sequence for J1-13
SEQ ID NO: 16 is the determined 3' cDNA sequence for J1-19
SEQ ID NO: 17 is the determined 5' cDNA sequence for J1-19
SEQ ID NO: 18 is the determined 3' cDNA sequence for J1-25
SEQ ID NO: 19 is the determined 5' cDNA sequence for J1-25
SEQ ID NO: 20 is the determined 5' cDNA sequence for J1-24
SEQ ID NO: 21 is the determined 3' cDNA sequence for J1-24
SEQ ID NO: 22 is the determined 5' cDNA sequence for K1-58
SEQ ID NO: 23 is the determined 3' cDNA sequence for K1-58
SEQ ID NO: 24 is the determined 5' cDNA sequence for K1-63
SEQ ID NO: 25 is the determined 3' cDNA sequence for K1-63
SEQ ID NO: 26 is the determined 5' cDNA sequence for L1-4
SEQ ID NO: 27 is the determined 3' cDNA sequence for L1-4
SEQ ID NO: 28 is the determined 5' cDNA sequence for L1-14
SEQ ID NO: 29 is the determined 3' cDNA sequence for L1-14
SEQ ID NO: 30 is the determined 3' cDNA sequence for J1-12
SEQ ID NO: 31 is the determined 3' cDNA sequence for J1-16
SEQ ID NO: 32 is the determined 3' cDNA sequence for J1-21
SEQ ID NO: 33 is the determined 3' cDNA sequence for K1-48
SEQ ID NO: 34 is the determined 3' cDNA sequence for K1-55
SEQ ID NO: 35 is the determined 3' cDNA sequence for L1-2
SEQ ID NO: 36 is the determined 3' cDNA sequence for L1-6
SEQ ID NO: 37 is the determined 3' cDNA sequence for N1-1858
SEQ ID NO: 38 is the determined 3' cDNA sequence for N1-1860
SEQ ID NO: 39 is the determined 3' cDNA sequence for N1-1861

SEQ ID NO: 40 is the determined 3' cDNA sequence for N1-1864
SEQ ID NO: 41 is the determined cDNA sequence for P5
SEQ ID NO: 42 is the determined cDNA sequence for P8
SEQ ID NO: 43 is the determined cDNA sequence for P9
SEQ ID NO: 44 is the determined cDNA sequence for P18
SEQ ID NO: 45 is the determined cDNA sequence for P20
SEQ ID NO: 46 is the determined cDNA sequence for P29
SEQ ID NO: 47 is the determined cDNA sequence for P30
SEQ ID NO: 48 is the determined cDNA sequence for P34
SEQ ID NO: 49 is the determined cDNA sequence for P36
SEQ ID NO: 50 is the determined cDNA sequence for P38
SEQ ID NO: 51 is the determined cDNA sequence for P39
SEQ ID NO: 52 is the determined cDNA sequence for P42
SEQ ID NO: 53 is the determined cDNA sequence for P47
SEQ ID NO: 54 is the determined cDNA sequence for P49
SEQ ID NO: 55 is the determined cDNA sequence for P50
SEQ ID NO: 56 is the determined cDNA sequence for P53
SEQ ID NO: 57 is the determined cDNA sequence for P55
SEQ ID NO: 58 is the determined cDNA sequence for P60
SEQ ID NO: 59 is the determined cDNA sequence for P64
SEQ ID NO: 60 is the determined cDNA sequence for P65
SEQ ID NO: 61 is the determined cDNA sequence for P73
SEQ ID NO: 62 is the determined cDNA sequence for P75
SEQ ID NO: 63 is the determined cDNA sequence for P76
SEQ ID NO: 64 is the determined cDNA sequence for P79
SEQ ID NO: 65 is the determined cDNA sequence for P84
SEQ ID NO: 66 is the determined cDNA sequence for P68
SEQ ID NO: 67 is the determined cDNA sequence for P80
SEQ ID NO: 68 is the determined cDNA sequence for P82
SEQ ID NO: 69 is the determined cDNA sequence for U1-3064
SEQ ID NO: 70 is the determined cDNA sequence for U1-3065
SEQ ID NO: 71 is the determined cDNA sequence for V1-3692
SEQ ID NO: 72 is the determined cDNA sequence for 1A-3905
SEQ ID NO: 73 is the determined cDNA sequence for V1-3686
SEQ ID NO: 74 is the determined cDNA sequence for R1-2330
SEQ ID NO: 75 is the determined cDNA sequence for 1B-3976
SEQ ID NO: 76 is the determined cDNA sequence for V1-3679

SEQ ID NO: 77 is the determined cDNA sequence for 1G-4736
SEQ ID NO: 78 is the determined cDNA sequence for 1G-4738
SEQ ID NO: 79 is the determined cDNA sequence for 1G-4741
SEQ ID NO: 80 is the determined cDNA sequence for 1G-4744
SEQ ID NO: 81 is the determined cDNA sequence for 1G-4734
SEQ ID NO: 82 is the determined cDNA sequence for 1H-4774
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SEQ ID NO: 84 is the determined cDNA sequence for 1H-4785
SEQ ID NO: 85 is the determined cDNA sequence for 1H-4787
SEQ ID NO: 86 is the determined cDNA sequence for 1H-4796
SEQ ID NO: 87 is the determined cDNA sequence for 1I-4807
SEQ ID NO: 88 is the determined cDNA sequence for 1I-4810
SEQ ID NO: 89 is the determined cDNA sequence for 1I-4811
SEQ ID NO: 90 is the determined cDNA sequence for 1J-4876
SEQ ID NO: 91 is the determined cDNA sequence for 1K-4884
SEQ ID NO: 92 is the determined cDNA sequence for 1K-4896
SEQ ID NO: 93 is the determined cDNA sequence for 1G-4761
SEQ ID NO: 94 is the determined cDNA sequence for 1G-4762
SEQ ID NO: 95 is the determined cDNA sequence for 1H-4766
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SEQ ID NO: 102 is the determined cDNA sequence for 1D-4288
SEQ ID NO: 103 is the determined cDNA sequence for 1D-4283
SEQ ID NO: 104 is the determined cDNA sequence for 1D-4304
SEQ ID NO: 105 is the determined cDNA sequence for 1D-4296
SEQ ID NO: 106 is the determined cDNA sequence for 1D-4280
SEQ ID NO: 107 is the determined full length cDNA sequence for F1-12 (also referred to as P504S)
SEQ ID NO: 108 is the predicted amino acid sequence for F1-12
SEQ ID NO: 109 is the determined full length cDNA sequence for J1-17
SEQ ID NO: 110 is the determined full length cDNA sequence for L1-12
SEQ ID NO: 111 is the determined full length cDNA sequence for N1-1862
SEQ ID NO: 112 is the predicted amino acid sequence for J1-17

SEQ ID NO: 113 is the predicted amino acid sequence for L1-12
SEQ ID NO: 114 is the predicted amino acid sequence for N1-1862
SEQ ID NO: 115 is the determined cDNA sequence for P89
SEQ ID NO: 116 is the determined cDNA sequence for P90
SEQ ID NO: 117 is the determined cDNA sequence for P92
SEQ ID NO: 118 is the determined cDNA sequence for P95
SEQ ID NO: 119 is the determined cDNA sequence for P98
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SEQ ID NO: 121 is the determined cDNA sequence for P110
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SEQ ID NO: 168 is the determined cDNA sequence for P234
SEQ ID NO: 169 is the determined cDNA sequence for P235
SEQ ID NO: 170 is the determined cDNA sequence for P243
SEQ ID NO: 171 is the determined cDNA sequence for P703P-DE1
SEQ ID NO: 172 is the predicted amino acid sequence for P703P-DE1
SEQ ID NO: 173 is the determined cDNA sequence for P703P-DE2
SEQ ID NO: 174 is the determined cDNA sequence for P703P-DE6
SEQ ID NO: 175 is the determined cDNA sequence for P703P-DE13
SEQ ID NO: 176 is the predicted amino acid sequence for P703P-DE13
SEQ ID NO: 177 is the determined cDNA sequence for P703P-DE14
SEQ ID NO: 178 is the predicted amino acid sequence for P703P-DE14
SEQ ID NO: 179 is the determined extended cDNA sequence for 1G-4736
SEQ ID NO: 180 is the determined extended cDNA sequence for 1G-4738
SEQ ID NO: 181 is the determined extended cDNA sequence for 1G-4741
SEQ ID NO: 182 is the determined extended cDNA sequence for 1G-4744
SEQ ID NO: 183 is the determined extended cDNA sequence for 1H-4774
SEQ ID NO: 184 is the determined extended cDNA sequence for 1H-4781
SEQ ID NO: 185 is the determined extended cDNA sequence for 1H-4785
SEQ ID NO: 186 is the determined extended cDNA sequence for 1H-4787

SEQ ID NO: 187 is the determined extended cDNA sequence for 1H-4796
SEQ ID NO: 188 is the determined extended cDNA sequence for 1I-4807
SEQ ID NO: 189 is the determined 3' cDNA sequence for 1I-4810
SEQ ID NO: 190 is the determined 3' cDNA sequence for 1I-4811
SEQ ID NO: 191 is the determined extended cDNA sequence for 1J-4876
SEQ ID NO: 192 is the determined extended cDNA sequence for 1K-4884
SEQ ID NO: 193 is the determined extended cDNA sequence for 1K-4896
SEQ ID NO: 194 is the determined extended cDNA sequence for 1G-4761
SEQ ID NO: 195 is the determined extended cDNA sequence for 1G-4762
SEQ ID NO: 196 is the determined extended cDNA sequence for 1H-4766
SEQ ID NO: 197 is the determined 3' cDNA sequence for 1H-4770
SEQ ID NO: 198 is the determined 3' cDNA sequence for 1H-4771
SEQ ID NO: 199 is the determined extended cDNA sequence for 1H-4772
SEQ ID NO: 200 is the determined extended cDNA sequence for 1D-4309
SEQ ID NO: 201 is the determined extended cDNA sequence for 1D.1-4278
SEQ ID NO: 202 is the determined extended cDNA sequence for 1D-4288
SEQ ID NO: 203 is the determined extended cDNA sequence for 1D-4283
SEQ ID NO: 204 is the determined extended cDNA sequence for 1D-4304
SEQ ID NO: 205 is the determined extended cDNA sequence for 1D-4296
SEQ ID NO: 206 is the determined extended cDNA sequence for 1D-4280
SEQ ID NO: 207 is the determined cDNA sequence for 10-d8fwd
SEQ ID NO: 208 is the determined cDNA sequence for 10-H10con
SEQ ID NO: 209 is the determined cDNA sequence for 11-C8rev
SEQ ID NO: 210 is the determined cDNA sequence for 7.g6fwd
SEQ ID NO: 211 is the determined cDNA sequence for 7.g6rev
SEQ ID NO: 212 is the determined cDNA sequence for 8-b5fwd
SEQ ID NO: 213 is the determined cDNA sequence for 8-b5rev
SEQ ID NO: 214 is the determined cDNA sequence for 8-b6fwd
SEQ ID NO: 215 is the determined cDNA sequence for 8-b6 rev
SEQ ID NO: 216 is the determined cDNA sequence for 8-d4fwd
SEQ ID NO: 217 is the determined cDNA sequence for 8-d9rev
SEQ ID NO: 218 is the determined cDNA sequence for 8-g3fwd
SEQ ID NO: 219 is the determined cDNA sequence for 8-g3rev
SEQ ID NO: 220 is the determined cDNA sequence for 8-h11rev
SEQ ID NO: 221 is the determined cDNA sequence for g-f12fwd
SEQ ID NO: 222 is the determined cDNA sequence for g-f3rev
SEQ ID NO: 223 is the determined cDNA sequence for P509S

SEQ ID NO: 224 is the determined cDNA sequence for P510S
SEQ ID NO: 225 is the determined cDNA sequence for P703DE5
SEQ ID NO: 226 is the determined cDNA sequence for 9-A11
SEQ ID NO: 227 is the determined cDNA sequence for 8-C6
SEQ ID NO: 228 is the determined cDNA sequence for 8-H7
SEQ ID NO: 229 is the determined cDNA sequence for JPTPN13
SEQ ID NO: 230 is the determined cDNA sequence for JPTPN14
SEQ ID NO: 231 is the determined cDNA sequence for JPTPN23
SEQ ID NO: 232 is the determined cDNA sequence for JPTPN24
SEQ ID NO: 233 is the determined cDNA sequence for JPTPN25
SEQ ID NO: 234 is the determined cDNA sequence for JPTPN30
SEQ ID NO: 235 is the determined cDNA sequence for JPTPN34
SEQ ID NO: 236 is the determined cDNA sequence for PTPN35
SEQ ID NO: 237 is the determined cDNA sequence for JPTPN36
SEQ ID NO: 238 is the determined cDNA sequence for JPTPN38
SEQ ID NO: 239 is the determined cDNA sequence for JPTPN39
SEQ ID NO: 240 is the determined cDNA sequence for JPTPN40
SEQ ID NO: 241 is the determined cDNA sequence for JPTPN41
SEQ ID NO: 242 is the determined cDNA sequence for JPTPN42
SEQ ID NO: 243 is the determined cDNA sequence for JPTPN45
SEQ ID NO: 244 is the determined cDNA sequence for JPTPN46
SEQ ID NO: 245 is the determined cDNA sequence for JPTPN51
SEQ ID NO: 246 is the determined cDNA sequence for JPTPN56
SEQ ID NO: 247 is the determined cDNA sequence for PTPN64
SEQ ID NO: 248 is the determined cDNA sequence for JPTPN65
SEQ ID NO: 249 is the determined cDNA sequence for JPTPN67
SEQ ID NO: 250 is the determined cDNA sequence for JPTPN76
SEQ ID NO: 251 is the determined cDNA sequence for JPTPN84
SEQ ID NO: 252 is the determined cDNA sequence for JPTPN85
SEQ ID NO: 253 is the determined cDNA sequence for JPTPN86
SEQ ID NO: 254 is the determined cDNA sequence for JPTPN87
SEQ ID NO: 255 is the determined cDNA sequence for JPTPN88
SEQ ID NO: 256 is the determined cDNA sequence for JP1F1
SEQ ID NO: 257 is the determined cDNA sequence for JP1F2
SEQ ID NO: 258 is the determined cDNA sequence for JP1C2
SEQ ID NO: 259 is the determined cDNA sequence for JP1B1
SEQ ID NO: 260 is the determined cDNA sequence for JP1B2

SEQ ID NO: 261 is the determined cDNA sequence for JP1D3
SEQ ID NO: 262 is the determined cDNA sequence for JP1A4
SEQ ID NO: 263 is the determined cDNA sequence for JP1F5
SEQ ID NO: 264 is the determined cDNA sequence for JP1E6
SEQ ID NO: 265 is the determined cDNA sequence for JP1D6
SEQ ID NO: 266 is the determined cDNA sequence for JP1B5
SEQ ID NO: 267 is the determined cDNA sequence for JP1A6
SEQ ID NO: 268 is the determined cDNA sequence for JP1E8
SEQ ID NO: 269 is the determined cDNA sequence for JP1D7
SEQ ID NO: 270 is the determined cDNA sequence for JP1D9
SEQ ID NO: 271 is the determined cDNA sequence for JP1C10
SEQ ID NO: 272 is the determined cDNA sequence for JP1A9
SEQ ID NO: 273 is the determined cDNA sequence for JP1F12
SEQ ID NO: 274 is the determined cDNA sequence for JP1E12
SEQ ID NO: 275 is the determined cDNA sequence for JP1D11
SEQ ID NO: 276 is the determined cDNA sequence for JP1C11
SEQ ID NO: 277 is the determined cDNA sequence for JP1C12
SEQ ID NO: 278 is the determined cDNA sequence for JP1B12
SEQ ID NO: 279 is the determined cDNA sequence for JP1A12
SEQ ID NO: 280 is the determined cDNA sequence for JP8G2
SEQ ID NO: 281 is the determined cDNA sequence for JP8H1
SEQ ID NO: 282 is the determined cDNA sequence for JP8H2
SEQ ID NO: 283 is the determined cDNA sequence for JP8A3
SEQ ID NO: 284 is the determined cDNA sequence for JP8A4
SEQ ID NO: 285 is the determined cDNA sequence for JP8C3
SEQ ID NO: 286 is the determined cDNA sequence for JP8G4
SEQ ID NO: 287 is the determined cDNA sequence for JP8B6
SEQ ID NO: 288 is the determined cDNA sequence for JP8D6
SEQ ID NO: 289 is the determined cDNA sequence for JP8F5
SEQ ID NO: 290 is the determined cDNA sequence for JP8A8
SEQ ID NO: 291 is the determined cDNA sequence for JP8C7
SEQ ID NO: 292 is the determined cDNA sequence for JP8D7
SEQ ID NO: 293 is the determined cDNA sequence for P8D8
SEQ ID NO: 294 is the determined cDNA sequence for JP8E7
SEQ ID NO: 295 is the determined cDNA sequence for JP8F8
SEQ ID NO: 296 is the determined cDNA sequence for JP8G8
SEQ ID NO: 297 is the determined cDNA sequence for JP8B10

SEQ ID NO: 298 is the determined cDNA sequence for JP8C10
SEQ ID NO: 299 is the determined cDNA sequence for JP8E9
SEQ ID NO: 300 is the determined cDNA sequence for JP8E10
SEQ ID NO: 301 is the determined cDNA sequence for JP8F9
SEQ ID NO: 302 is the determined cDNA sequence for JP8H9
SEQ ID NO: 303 is the determined cDNA sequence for JP8C12
SEQ ID NO: 304 is the determined cDNA sequence for JP8E11
SEQ ID NO: 305 is the determined cDNA sequence for JP8E12
SEQ ID NO: 306 is the amino acid sequence for the peptide PS2#12
SEQ ID NO: 307 is the determined cDNA sequence for P711P
SEQ ID NO: 308 is the determined cDNA sequence for P712P
SEQ ID NO: 309 is the determined cDNA sequence for CLONE23
SEQ ID NO: 310 is the determined cDNA sequence for P774P
SEQ ID NO: 311 is the determined cDNA sequence for P775P
SEQ ID NO: 312 is the determined cDNA sequence for P715P
SEQ ID NO: 313 is the determined cDNA sequence for P710P
SEQ ID NO: 314 is the determined cDNA sequence for P767P
SEQ ID NO: 315 is the determined cDNA sequence for P768P
SEQ ID NO: 316-325 are the determined cDNA sequences of previously isolated genes
SEQ ID NO: 326 is the determined cDNA sequence for P703PDE5
SEQ ID NO: 327 is the predicted amino acid sequence for P703PDE5
SEQ ID NO: 328 is the determined cDNA sequence for P703P6.26
SEQ ID NO: 329 is the predicted amino acid sequence for P703P6.26
SEQ ID NO: 330 is the determined cDNA sequence for P703PX-23
SEQ ID NO: 331 is the predicted amino acid sequence for P703PX-23
SEQ ID NO: 332 is the determined full length cDNA sequence for P509S
SEQ ID NO: 333 is the determined extended cDNA sequence for P707P (also referred to as 11-C9)
SEQ ID NO: 334 is the determined cDNA sequence for P714P
SEQ ID NO: 335 is the determined cDNA sequence for P705P (also referred to as 9-F3)
SEQ ID NO: 336 is the predicted amino acid sequence for P705P
SEQ ID NO: 337 is the amino acid sequence of the peptide P1S#10
SEQ ID NO: 338 is the amino acid sequence of the peptide p5
SEQ ID NO: 339 is the predicted amino acid sequence of P509S
SEQ ID NO: 340 is the determined cDNA sequence for P778P
SEQ ID NO: 341 is the determined cDNA sequence for P786P
SEQ ID NO: 342 is the determined cDNA sequence for P789P

SEQ ID NO: 343 is the determined cDNA sequence for a clone showing homology to Homo sapiens MM46 mRNA

SEQ ID NO: 344 is the determined cDNA sequence for a clone showing homology to Homo sapiens TNF-alpha stimulated ABC protein (ABC50) mRNA

SEQ ID NO: 345 is the determined cDNA sequence for a clone showing homology to Homo sapiens mRNA for E-cadherin

SEQ ID NO: 346 is the determined cDNA sequence for a clone showing homology to Human nuclear-encoded mitochondrial serine hydroxymethyltransferase (SHMT)

SEQ ID NO: 347 is the determined cDNA sequence for a clone showing homology to Homo sapiens natural resistance-associated macrophage protein2 (NRAMP2)

SEQ ID NO: 348 is the determined cDNA sequence for a clone showing homology to Homo sapiens phosphoglucomutase-related protein (PGMRP)

SEQ ID NO: 349 is the determined cDNA sequence for a clone showing homology to Human mRNA for proteosome subunit p40

SEQ ID NO: 350 is the determined cDNA sequence for P777P

SEQ ID NO: 351 is the determined cDNA sequence for P779P

SEQ ID NO: 352 is the determined cDNA sequence for P790P

SEQ ID NO: 353 is the determined cDNA sequence for P784P

SEQ ID NO: 354 is the determined cDNA sequence for P776P

SEQ ID NO: 355 is the determined cDNA sequence for P780P

SEQ ID NO: 356 is the determined cDNA sequence for P544S

SEQ ID NO: 357 is the determined cDNA sequence for P745S

SEQ ID NO: 358 is the determined cDNA sequence for P782P

SEQ ID NO: 359 is the determined cDNA sequence for P783P

SEQ ID NO: 360 is the determined cDNA sequence for unknown 17984

SEQ ID NO: 361 is the determined cDNA sequence for P787P

SEQ ID NO: 362 is the determined cDNA sequence for P788P

SEQ ID NO: 363 is the determined cDNA sequence for unknown 17994

SEQ ID NO: 364 is the determined cDNA sequence for P781P

SEQ ID NO: 365 is the determined cDNA sequence for P785P

SEQ ID NO: 366-375 are the determined cDNA sequences for splice variants of B305D.

SEQ ID NO: 376 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO: 366.

SEQ ID NO: 377 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO: 372.

SEQ ID NO: 378 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO: 373.

SEQ ID NO: 379 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO: 374.

SEQ ID NO: 380 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO: 375.

SEQ ID NO: 381 is the determined cDNA sequence for B716P.

SEQ ID NO: 382 is the determined full-length cDNA sequence for P711P.

SEQ ID NO: 383 is the predicted amino acid sequence for P711P.

SEQ ID NO: 384 is the cDNA sequence for P1000C.

SEQ ID NO: 385 is the cDNA sequence for CGI-82.

SEQ ID NO:386 is the cDNA sequence for 23320.

SEQ ID NO:387 is the cDNA sequence for CGI-69.

SEQ ID NO:388 is the cDNA sequence for L-iditol-2-dehydrogenase.

SEQ ID NO:389 is the cDNA sequence for 23379.

SEQ ID NO:390 is the cDNA sequence for 23381.

SEQ ID NO:391 is the cDNA sequence for KIAA0122.

SEQ ID NO:392 is the cDNA sequence for 23399.

SEQ ID NO:393 is the cDNA sequence for a previously identified gene.

SEQ ID NO:394 is the cDNA sequence for HCLBP.

SEQ ID NO:395 is the cDNA sequence for transglutaminase.

SEQ ID NO:396 is the cDNA sequence for a previously identified gene.

SEQ ID NO:397 is the cDNA sequence for PAP.

SEQ ID NO:398 is the cDNA sequence for Ets transcription factor PDEF.

SEQ ID NO:399 is the cDNA sequence for hTGR.

SEQ ID NO:400 is the cDNA sequence for KIAA0295.

SEQ ID NO:401 is the cDNA sequence for 22545.

SEQ ID NO:402 is the cDNA sequence for 22547.

SEQ ID NO:403 is the cDNA sequence for 22548.

SEQ ID NO:404 is the cDNA sequence for 22550.

SEQ ID NO:405 is the cDNA sequence for 22551.

SEQ ID NO:406 is the cDNA sequence for 22552.

SEQ ID NO:407 is the cDNA sequence for 22553.

SEQ ID NO:408 is the cDNA sequence for 22558.

SEQ ID NO:409 is the cDNA sequence for 22562.

SEQ ID NO:410 is the cDNA sequence for 22565.

SEQ ID NO:411 is the cDNA sequence for 22567.

SEQ ID NO:412 is the cDNA sequence for 22568.

SEQ ID NO:413 is the cDNA sequence for 22570.

SEQ ID NO:414 is the cDNA sequence for 22571.
SEQ ID NO:415 is the cDNA sequence for 22572.
SEQ ID NO:416 is the cDNA sequence for 22573.
SEQ ID NO:417 is the cDNA sequence for 22573.
SEQ ID NO:418 is the cDNA sequence for 22575.
SEQ ID NO:419 is the cDNA sequence for 22580.
SEQ ID NO:420 is the cDNA sequence for 22581.
SEQ ID NO:421 is the cDNA sequence for 22582.
SEQ ID NO:422 is the cDNA sequence for 22583.
SEQ ID NO:423 is the cDNA sequence for 22584.
SEQ ID NO:424 is the cDNA sequence for 22585.
SEQ ID NO:425 is the cDNA sequence for 22586.
SEQ ID NO:426 is the cDNA sequence for 22587.
SEQ ID NO:427 is the cDNA sequence for 22588.
SEQ ID NO:428 is the cDNA sequence for 22589.
SEQ ID NO:429 is the cDNA sequence for 22590.
SEQ ID NO:430 is the cDNA sequence for 22591.
SEQ ID NO:431 is the cDNA sequence for 22592.
SEQ ID NO:432 is the cDNA sequence for 22593.
SEQ ID NO:433 is the cDNA sequence for 22594.
SEQ ID NO:434 is the cDNA sequence for 22595.
SEQ ID NO:435 is the cDNA sequence for 22596.
SEQ ID NO:436 is the cDNA sequence for 22847.
SEQ ID NO:437 is the cDNA sequence for 22848.
SEQ ID NO:438 is the cDNA sequence for 22849.
SEQ ID NO:439 is the cDNA sequence for 22851.
SEQ ID NO:440 is the cDNA sequence for 22852.
SEQ ID NO:441 is the cDNA sequence for 22853.
SEQ ID NO:442 is the cDNA sequence for 22854.
SEQ ID NO:443 is the cDNA sequence for 22855.
SEQ ID NO:444 is the cDNA sequence for 22856.
SEQ ID NO:445 is the cDNA sequence for 22857.
SEQ ID NO:446 is the cDNA sequence for 23601.
SEQ ID NO:447 is the cDNA sequence for 23602.
SEQ ID NO:448 is the cDNA sequence for 23605.
SEQ ID NO:449 is the cDNA sequence for 23606.
SEQ ID NO:450 is the cDNA sequence for 23612.

SEQ ID NO:451 is the cDNA sequence for 23614.
SEQ ID NO:452 is the cDNA sequence for 23618.
SEQ ID NO:453 is the cDNA sequence for 23622.
SEQ ID NO:454 is the cDNA sequence for folate hydrolase.
SEQ ID NO:455 is the cDNA sequence for LIM protein.
SEQ ID NO:456 is the cDNA sequence for a known gene.
SEQ ID NO:457 is the cDNA sequence for a known gene.
SEQ ID NO:458 is the cDNA sequence for a previously identified gene.
SEQ ID NO:459 is the cDNA sequence for 23045.
SEQ ID NO:460 is the cDNA sequence for 23032.
SEQ ID NO:461 is the cDNA sequence for 23054.
SEQ ID NOs:462-467 are cDNA sequences for known genes.
SEQ ID NOs:468-471 are cDNA sequences for P710P.
SEQ ID NO:472 is a cDNA sequence for P1001C.

DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for the therapy and diagnosis of cancer, such as prostate cancer. The compositions described herein may include prostate tumor polypeptides, polynucleotides encoding such polypeptides, binding agents such as antibodies, antigen presenting cells (APCs) and/or immune system cells (*e.g.*, T cells). Polypeptides of the present invention generally comprise at least a portion (such as an immunogenic portion) of a prostate tumor protein or a variant thereof. A "prostate tumor protein" is a protein that is expressed in prostate tumor cells at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in a normal tissue, as determined using a representative assay provided herein. Certain prostate tumor proteins are tumor proteins that react detectably (within an immunoassay, such as an ELISA or Western blot) with antisera of a patient afflicted with prostate cancer. Polynucleotides of the subject invention generally comprise a DNA or RNA sequence that encodes all or a portion of such a polypeptide, or that is complementary to such a sequence. Antibodies are generally immune system proteins, or antigen-binding fragments thereof, that are capable of binding to a polypeptide as described above. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B-cells that express a polypeptide as described above. T cells that may be employed within such compositions are generally T cells that are specific for a polypeptide as described above.

The present invention is based on the discovery of human prostate tumor proteins. Sequences of polynucleotides encoding certain tumor proteins, or portions thereof, are provided in SEQ ID NOs:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 or 384-472. Sequences of polypeptides comprising at least a portion of a tumor protein are provided in SEQ ID NOs:112-114, 172, 176, 178, 327, 329, 331, 336, 339, 376-380 and 383.

PROSTATE TUMOR PROTEIN POLYNUCLEOTIDES

Any polynucleotide that encodes a prostate tumor protein or a portion or other variant thereof as described herein is encompassed by the present invention. Preferred polynucleotides comprise at least 15 consecutive nucleotides, preferably at least 30 consecutive nucleotides and more preferably at least 45 consecutive nucleotides, that encode a portion of a prostate tumor protein. More preferably, a polynucleotide encodes an immunogenic portion of a prostate tumor protein. Polynucleotides complementary to any such sequences are also encompassed by the present invention. Polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. RNA molecules include HnRNA molecules, which contain introns and correspond to a DNA molecule in a one-to-one manner, and mRNA molecules, which do not contain introns. Additional coding or non-coding sequences may, but need not, be present within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

Polynucleotides may comprise a native sequence (*i.e.*, an endogenous sequence that encodes a prostate tumor protein or a portion thereof) or may comprise a variant of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native tumor protein. The effect on the immunogenicity of the encoded polypeptide may generally be assessed as described herein. Variants preferably exhibit at least about 70% identity, more preferably at least about 80% identity and most preferably at least about 90% identity to a polynucleotide sequence that encodes a native prostate tumor protein or a portion thereof.

Two polynucleotide or polypeptide sequences are said to be "identical" if the sequence of nucleotides or amino acids in the two sequences is the same when aligned for maximum correspondence as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and compare local regions of sequence similarity. A "comparison window" as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, 40 to about 50,

in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins – Matrices for detecting distant relationships. In Dayhoff, M.O. (ed.) *Atlas of Protein Sequence and Structure*, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990) Unified Approach to Alignment and Phylogenesis pp. 626-645 *Methods in Enzymology* vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) *CABIOS* 5:151-153; Myers, E.W. and Muller W. (1988) *CABIOS* 4:11-17; Robinson, E.D. (1971) *Comb. Theor* 11:105; Santou, N. Nes, M. (1987) *Mol. Biol. Evol.* 4:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) *Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy*, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) *Proc. Natl. Acad. Sci. USA* 80:726-730.

Preferably, the “percentage of sequence identity” is determined by comparing two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the comparison window may comprise additions or deletions (*i.e.*, gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequences (which does not comprise additions or deletions) for optimal alignment of the two sequences. The percentage is calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the reference sequence (*i.e.*, the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

Variants may also, or alternatively, be substantially homologous to a native gene, or a portion or complement thereof. Such polynucleotide variants are capable of hybridizing under moderately stringent conditions to a naturally occurring DNA sequence encoding a native prostate tumor protein (or a complementary sequence). Suitable moderately stringent conditions include prewashing in a solution of 5 X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

It will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a polypeptide as described herein. Some of these polynucleotides bear minimal homology to

the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of one or more mutations, such as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

Polynucleotides may be prepared using any of a variety of techniques. For example, a polynucleotide may be identified, as described in more detail below, by screening a microarray of cDNAs for tumor-associated expression (*i.e.*, expression that is at least five fold greater in a prostate tumor than in normal tissue, as determined using a representative assay provided herein). Such screens may be performed using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially as described by Schena et al., *Proc. Natl. Acad. Sci. USA* 93:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA* 94:2150-2155, 1997). Alternatively, polypeptides may be amplified from cDNA prepared from cells expressing the proteins described herein, such as prostate tumor cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

An amplified portion may be used to isolate a full length gene from a suitable library (*e.g.*, a prostate tumor cDNA library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for identifying 5' and upstream regions of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

For hybridization techniques, a partial sequence may be labeled (*e.g.*, by nick-translation or end-labeling with ^{32}P) using well known techniques. A bacterial or bacteriophage library is then screened by hybridizing filters containing denatured bacterial colonies (or lawns containing phage plaques) with the labeled probe (*see* Sambrook et al., *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratories, Cold Spring Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR using a primer from the partial sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using

standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences are then assembled into a single contiguous sequence. A full length cDNA molecule can be generated by ligating suitable fragments, using well known techniques.

Alternatively, there are numerous amplification techniques for obtaining a full length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed using, for example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

One such amplification technique is inverse PCR (*see* Triglia et al., *Nucl. Acids Res.* 16:8186, 1988), which uses restriction enzymes to generate a fragment in the known region of the gene. The fragment is then circularized by intramolecular ligation and used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the known sequence, is described in WO 96/38591. Another such technique is known as "rapid amplification of cDNA ends" or RACE. This technique involves the use of an internal primer and an external primer, which hybridizes to a polyA region or vector sequence, to identify sequences that are 5' and 3' of a known sequence. Additional techniques include capture PCR (Lagerstrom et al., *PCR Methods Applic.* 1:111-19, 1991) and walking PCR (Parker et al., *Nucl. Acids. Res.* 19:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that available from GenBank. Searches for overlapping ESTs may generally be performed using well known programs (*e.g.*, NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence.

Certain nucleic acid sequences of cDNA molecules encoding at least a portion of a prostate tumor protein are provided in SEQ ID NOs:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 or 384-472. Isolation of these

polynucleotides is described below. Each of these prostate tumor proteins was overexpressed in prostate tumor tissue.

Polynucleotide variants may generally be prepared by any method known in the art, including chemical synthesis by, for example, solid phase phosphoramidite chemical synthesis. Modifications in a polynucleotide sequence may also be introduced using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis (*see* Adelman et al., *DNA* 2:183, 1983). Alternatively, RNA molecules may be generated by *in vitro* or *in vivo* transcription of DNA sequences encoding a prostate tumor protein, or portion thereof, provided that the DNA is incorporated into a vector with a suitable RNA polymerase promoter (such as T7 or SP6). Certain portions may be used to prepare an encoded polypeptide, as described herein. In addition, or alternatively, a portion may be administered to a patient such that the encoded polypeptide is generated *in vivo* (*e.g.*, by transfecting antigen-presenting cells, such as dendritic cells, with a cDNA construct encoding a prostate tumor polypeptide, and administering the transfected cells to the patient).

A portion of a sequence complementary to a coding sequence (*i.e.*, an antisense polynucleotide) may also be used as a probe or to modulate gene expression. cDNA constructs that can be transcribed into antisense RNA may also be introduced into cells of tissues to facilitate the production of antisense RNA. An antisense polynucleotide may be used, as described herein, to inhibit expression of a tumor protein. Antisense technology can be used to control gene expression through triple-helix formation, which compromises the ability of the double helix to open sufficiently for the binding of polymerases, transcription factors or regulatory molecules (*see* Gee et al., *In Huber and Carr, Molecular and Immunologic Approaches*, Futura Publishing Co. (Mt. Kisco, NY; 1994)). Alternatively, an antisense molecule may be designed to hybridize with a control region of a gene (*e.g.*, promoter, enhancer or transcription initiation site), and block transcription of the gene; or to block translation by inhibiting binding of a transcript to ribosomes.

A portion of a coding sequence, or of a complementary sequence, may also be designed as a probe or primer to detect gene expression. Probes may be labeled with a variety of reporter groups, such as radionuclides and enzymes, and are preferably at least 10 nucleotides in length, more preferably at least 20 nucleotides in length and still more preferably at least 30 nucleotides in length. Primers, as noted above, are preferably 22-30 nucleotides in length.

Any polynucleotide may be further modified to increase stability *in vivo*. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3' ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such

as inosine, queosine and wybutosine, as well as acetyl- methyl-, thio- and other modified forms of adenine, cytidine, guanine, thymine and uridine.

Nucleotide sequences as described herein may be joined to a variety of other nucleotide sequences using established recombinant DNA techniques. For example, a polynucleotide may be cloned into any of a variety of cloning vectors, including plasmids, phagemids, lambda phage derivatives and cosmids. Vectors of particular interest include expression vectors, replication vectors, probe generation vectors and sequencing vectors. In general, a vector will contain an origin of replication functional in at least one organism, convenient restriction endonuclease sites and one or more selectable markers. Other elements will depend upon the desired use, and will be apparent to those of ordinary skill in the art.

Within certain embodiments, polynucleotides may be formulated so as to permit entry into a cell of a mammal, and expression therein. Such formulations are particularly useful for therapeutic purposes, as described below. Those of ordinary skill in the art will appreciate that there are many ways to achieve expression of a polynucleotide in a target cell, and any suitable method may be employed. For example, a polynucleotide may be incorporated into a viral vector such as, but not limited to, adenovirus, adeno-associated virus, retrovirus, or vaccinia or other pox virus (*e.g.*, avian pox virus). Techniques for incorporating DNA into such vectors are well known to those of ordinary skill in the art. A retroviral vector may additionally transfer or incorporate a gene for a selectable marker (to aid in the identification or selection of transduced cells) and/or a targeting moiety, such as a gene that encodes a ligand for a receptor on a specific target cell, to render the vector target specific. Targeting may also be accomplished using an antibody, by methods known to those of ordinary skill in the art.

Other formulations for therapeutic purposes include colloidal dispersion systems, such as macromolecule complexes, nanocapsules, microspheres, beads, and lipid-based systems including oil-in-water emulsions, micelles, mixed micelles, and liposomes. A preferred colloidal system for use as a delivery vehicle *in vitro* and *in vivo* is a liposome (*i.e.*, an artificial membrane vesicle). The preparation and use of such systems is well known in the art.

PROSTATE TUMOR POLYPEPTIDES

Within the context of the present invention, polypeptides may comprise at least an immunogenic portion of a prostate tumor protein or a variant thereof, as described herein. As noted above, a "prostate tumor protein" is a protein that is expressed by prostate tumor cells. Proteins that are prostate tumor proteins also react detectably within an immunoassay (such as an ELISA) with antisera from a patient with prostate cancer. Polypeptides as described herein may be of any length. Additional sequences derived from

the native protein and/or heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

An "immunogenic portion," as used herein is a portion of a protein that is recognized (*i.e.*, specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more preferably at least 10, and still more preferably at least 20 amino acid residues of a prostate tumor protein or a variant thereof. Certain preferred immunogenic portions include peptides in which an N-terminal leader sequence and/or transmembrane domain have been deleted. Other preferred immunogenic portions may contain a small N- and/or C-terminal deletion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids), relative to the mature protein.

Immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul, *Fundamental Immunology*, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with antigen-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "antigen-specific" if they specifically bind to an antigen (*i.e.*, they react with the protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera and antibodies may be prepared as described herein, and using well known techniques. An immunogenic portion of a native prostate tumor protein is a portion that reacts with such antisera and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (*e.g.*, in an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length polypeptide. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, ¹²⁵I-labeled Protein A.

As noted above, a composition may comprise a variant of a native prostate tumor protein. A polypeptide "variant," as used herein, is a polypeptide that differs from a native prostate tumor protein in one or more substitutions, deletions, additions and/or insertions, such that the immunogenicity of the polypeptide is not substantially diminished. In other words, the ability of a variant to react with antigen-specific antisera may be enhanced or unchanged, relative to the native protein, or may be diminished by less than 50%, and preferably less than 20%, relative to the native protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with antigen-specific antibodies or antisera as described herein.

Preferred variants include those in which one or more portions, such as an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein. Polypeptide variants preferably exhibit at least about 70%, more preferably at least about 90% and most preferably at least about 95% identity (determined as described above) to the identified polypeptides.

Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydropathic nature of the polypeptide to be substantially unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine, isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain nonconservative changes. In a preferred embodiment, variant polypeptides differ from a native sequence by substitution, deletion or addition of five amino acids or fewer. Variants may also (or alternatively) be modified by, for example, the deletion or addition of amino acids that have minimal influence on the immunogenicity, secondary structure and hydropathic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (*e.g.*, poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast and higher eukaryotic cells. Preferably, the host cells employed are

E. coli, yeast or a mammalian cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may also be generated by synthetic means, using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, *J. Am. Chem. Soc.* 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied BioSystems Division (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises at least one polypeptide as described herein and an unrelated sequence, such as a known tumor protein. A fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner), preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both immunological and expression enhancing fusion partners. Other fusion partners may be selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques, including chemical conjugation. Preferably, a fusion protein is expressed as a recombinant protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that the reading frames of the sequences are in phase. This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

A peptide linker sequence may be employed to separate the first and the second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into

the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides; and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea et al., *Gene* 40:39-46, 1985; Murphy et al., *Proc. Natl. Acad. Sci. USA* 83:8258-8262, 1986; U.S. Patent No. 4,935,233 and U.S. Patent No. 4,751,180. The linker sequence may generally be from 1 to about 50 amino acids in length. Linker sequences are not required when the first and second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

The ligated DNA sequences are operably linked to suitable transcriptional or translational regulatory elements. The regulatory elements responsible for expression of DNA are located only 5' to the DNA sequence encoding the first polypeptides. Similarly, stop codons required to end translation and transcription termination signals are only present 3' to the DNA sequence encoding the second polypeptide.

Fusion proteins are also provided that comprise a polypeptide of the present invention together with an unrelated immunogenic protein. Preferably the immunogenic protein is capable of eliciting a recall response. Examples of such proteins include tetanus, tuberculosis and hepatitis proteins (*see*, for example, Stoute et al. *New Engl. J. Med.*, 336:86-91, 1997).

Within preferred embodiments, an immunological fusion partner is derived from protein D, a surface protein of the gram-negative bacterium *Haemophilus influenza B* (WO 91/18926). Preferably, a protein D derivative comprises approximately the first third of the protein (*e.g.*, the first N-terminal 100-110 amino acids), and a protein D derivative may be lipidated. Within certain preferred embodiments, the first 109 residues of a Lipoprotein D fusion partner is included on the N-terminus to provide the polypeptide with additional exogenous T-cell epitopes and to increase the expression level in *E. coli* (thus functioning as an expression enhancer). The lipid tail ensures optimal presentation of the antigen to antigen presenting cells. Other fusion partners include the non-structural protein from influenzae virus, NS1 (hemagglutinin). Typically, the N-terminal 81 amino acids are used, although different fragments that include T-helper epitopes may be used.

In another embodiment, the immunological fusion partner is the protein known as LYTA, or a portion thereof (preferably a C-terminal portion). LYTA is derived from *Streptococcus pneumoniae*, which synthesizes an N-acetyl-L-alanine amidase known as

amidase LYTA (encoded by the *LytA* gene; *Gene* 43:265-292, 1986). LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of *E. coli* C-LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid proteins containing the C-LYTA fragment at the amino terminus has been described (*see Biotechnology* 10:795-798, 1992). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that is removed from its original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95% pure and most preferably at least about 99% pure. A polynucleotide is considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

BINDING AGENTS

The present invention further provides agents, such as antibodies and antigen-binding fragments thereof, that specifically bind to a prostate tumor protein. As used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to a prostate tumor protein if it reacts at a detectable level (within, for example, an ELISA) with a prostate tumor protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules such that a complex is formed. The ability to bind may be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about 10^3 L/mol. The binding constant may be determined using methods well known in the art.

Binding agents may be further capable of differentiating between patients with and without a cancer, such as prostate cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a prostate tumor protein will generate a signal indicating the presence of a cancer in at least about 20% of patients with the disease, and will generate a negative signal indicating the absence of the disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies this requirement, biological samples (*e.g.*, blood, sera, urine and/or tumor biopsies) from

patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein for the presence of polypeptides that bind to the binding agent. It will be apparent that a statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. *See, e.g., Harlow and Lane, Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (*e.g., mice, rats, rabbits, sheep or goats*). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically. Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.* 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (*i.e., reactivity with the polypeptide of interest*). Such cell lines may be produced, for example, from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient

time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide. Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

Within certain embodiments, the use of antigen-binding fragments of antibodies may be preferred. Such fragments include Fab fragments, which may be prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity chromatography on protein A bead columns.

Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include ^{90}Y , ^{123}I , ^{125}I , ^{131}I , ^{186}Re , ^{188}Re , ^{211}At , and ^{212}Bi . Preferred drugs include methotrexate, and pyrimidine and purine analogs. Preferred differentiation inducers include phorbol esters and butyric acid. Preferred toxins include ricin, abrin, diphtheria toxin, cholera toxin, gelonin, *Pseudomonas* exotoxin, *Shigella* toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (*e.g.*, covalently bonded) to a suitable monoclonal antibody either directly or indirectly (*e.g.*, via a linker group). A direct reaction between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid halide, or with an alkyl group containing a good leaving group (*e.g.*, a halide) on the other.

Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and

thus increase the coupling efficiency. An increase in chemical reactivity may also facilitate the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl groups or oxidized carbohydrate residues. There are numerous references describing such methodology, *e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.

Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a linker group which is cleavable during or upon internalization into a cell. A number of different cleavable linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (*e.g.*, U.S. Patent No. 4,489,710, to Spitler), by irradiation of a photolabile bond (*e.g.*, U.S. Patent No. 4,625,014, to Senter et al.), by hydrolysis of derivatized amino acid side chains (*e.g.*, U.S. Patent No. 4,638,045, to Kohn et al.), by serum complement-mediated hydrolysis (*e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.), and acid-catalyzed hydrolysis (*e.g.*, U.S. Patent No. 4,569,789, to Blattler et al.).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers which provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (*e.g.*, U.S. Patent No. 4,507,234, to Kato et al.), peptides and polysaccharides such as aminodextran (*e.g.*, U.S. Patent No. 4,699,784, to Shih et al.). A carrier may also bear an agent by noncovalent bonding or by encapsulation, such as within a liposome vesicle (*e.g.*, U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No. 4,735,792 discloses representative radiohalogenated small molecules and their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison et al. discloses representative chelating compounds and their synthesis.

A variety of routes of administration for the antibodies and immunoconjugates may be used. Typically, administration will be intravenous, intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

T CELLS

Immunotherapeutic compositions may also, or alternatively, comprise T cells specific for a prostate tumor protein. Such cells may generally be prepared *in vitro* or *ex vivo*, using standard procedures. For example, T cells may be isolated from bone marrow, peripheral blood, or a fraction of bone marrow or peripheral blood of a patient, using a commercially available cell separation system, such as the CEPRATE™ system, available from CellPro Inc., Bothell WA (*see also* U.S. Patent No. 5,240,856; U.S. Patent No. 5,215,926; WO 89/06280; WO 91/16116 and WO 92/07243). Alternatively, T cells may be derived from related or unrelated humans, non-human mammals, cell lines or cultures.

T cells may be stimulated with a prostate tumor polypeptide, polynucleotide encoding a prostate tumor polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, a prostate tumor polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T cells.

T cells are considered to be specific for a prostate tumor polypeptide if the T cells kill target cells coated with the polypeptide or expressing a gene encoding the polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as described in Chen et al., *Cancer Res.* 54:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an increased rate of DNA synthesis (*e.g.*, by pulse-labeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with a prostate tumor polypeptide (100 ng/ml - 100 µg/ml, preferably 200 ng/ml - 25 µg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells. Contact as described above for 2-3 hours should result in activation of the T cells, as measured using standard cytokine assays in which a two fold increase in the level of cytokine release (*e.g.*, TNF or IFN-γ) is indicative of T cell activation (*see* Coligan et al., *Current Protocols in Immunology*, vol. 1, Wiley Interscience

(Greene 1998)). T cells that have been activated in response to a prostate tumor polypeptide, polynucleotide or polypeptide-expressing APC may be CD4⁺ and/or CD8⁺. Prostate tumor protein-specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from either a patient or a related, or unrelated, donor and are administered to the patient following stimulation and expansion.

For therapeutic purposes, CD4⁺ or CD8⁺ T cells that proliferate in response to a prostate tumor polypeptide, polynucleotide or APC can be expanded in number either *in vitro* or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to a prostate tumor polypeptide, or a short peptide corresponding to an immunogenic portion of such a polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize a prostate tumor polypeptide. Alternatively, one or more T cells that proliferate in the presence of a prostate tumor protein can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution.

PHARMACEUTICAL COMPOSITIONS AND VACCINES

Within certain aspects, polypeptides, polynucleotides, T cells and/or binding agents disclosed herein may be incorporated into pharmaceutical compositions or immunogenic compositions (*i.e.*, vaccines). Pharmaceutical compositions comprise one or more such compounds and a physiologically acceptable carrier. Vaccines may comprise one or more such compounds and a non-specific immune response enhancer. A non-specific immune response enhancer may be any substance that enhances an immune response to an exogenous antigen. Examples of non-specific immune response enhancers include adjuvants, biodegradable microspheres (*e.g.*, polylactic galactide) and liposomes (into which the compound is incorporated; *see e.g.*, Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and vaccines within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example, one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound, within the composition or vaccine.

A pharmaceutical composition or vaccine may contain DNA encoding one or more of the polypeptides as described above, such that the polypeptide is generated *in situ*. As noted above, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Numerous gene delivery techniques are well known in the art, such as those described by Rolland, *Crit. Rev. Therap. Drug Carrier Systems* 15:143-198, 1998,

and references cited therein. Appropriate nucleic acid expression systems contain the necessary DNA sequences for expression in the patient (such as a suitable promoter and terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as *Bacillus-Calmette-Guerrin*) that expresses an immunogenic portion of the polypeptide on its cell surface or secretes such an epitope. In a preferred embodiment, the DNA may be introduced using a viral expression system (e.g., vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus. Suitable systems are disclosed, for example, in Fisher-Hoch et al., *Proc. Natl. Acad. Sci. USA* 86:317-321, 1989; Flexner et al., *Ann. N.Y. Acad. Sci.* 569:86-103, 1989; Flexner et al., *Vaccine* 8:17-21, 1990; U.S. Patent Nos. 4,603,112, 4,769,330, and 5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242; WO 91/02805; Berkner, *Biotechniques* 6:616-627, 1988; Rosenfeld et al., *Science* 252:431-434, 1991; Kolls et al., *Proc. Natl. Acad. Sci. USA* 91:215-219, 1994; Kass-Eisler et al., *Proc. Natl. Acad. Sci. USA* 90:11498-11502, 1993; Guzman et al., *Circulation* 88:2838-2848, 1993; and Guzman et al., *Cir. Res.* 73:1202-1207, 1993. Techniques for incorporating DNA into such expression systems are well known to those of ordinary skill in the art. The DNA may also be "naked," as described, for example, in Ulmer et al., *Science* 259:1745-1749, 1993 and reviewed by Cohen, *Science* 259:1691-1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells.

While any suitable carrier known to those of ordinary skill in the art may be employed in the pharmaceutical compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration. For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (e.g., polylactate polyglycolate) may also be employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S. Patent Nos. 4,897,268 and 5,075,109.

Such compositions may also comprise buffers (e.g., neutral buffered saline or phosphate buffered saline), carbohydrates (e.g., glucose, mannose, sucrose or dextran), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants, chelating agents such as EDTA or glutathione, adjuvants (e.g., aluminum hydroxide) and/or

preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of non-specific immune response enhancers may be employed in the vaccines of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bordetella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the vaccines provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (e.g., IFN- γ , IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (e.g., IL-4, IL-5, IL-6, IL-10 and TNF- β) tend to favor the induction of humoral immune responses. Following application of a vaccine as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, *Ann. Rev. Immunol.* 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Ribi ImmunoChem Research Inc. (Hamilton, MT; see US Patent Nos. 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555. Another preferred adjuvant is a saponin, preferably QS21, which may be used alone or in combination with other adjuvants. For example, an enhanced system involves the combination of a monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153, or a less reactogenic composition where the QS21 is

quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprises an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is described in WO 95/17210. Any vaccine provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient.

The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a capsule or sponge that effects a slow release of compound following administration). Such formulations may generally be prepared using well known technology and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within a reservoir surrounded by a rate controlling membrane. Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical compositions and vaccines to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects *per se* and/or to be immunologically compatible with the receiver (*i.e.*, matched HLA haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

Certain preferred embodiments of the present invention use dendritic cells or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature* 392:245-251, 1998) and have been shown to be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (*see* Timmerman and Levy, *Ann. Rev. Med.* 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate *in situ*, with marked cytoplasmic processes (dendrites) visible *in vitro*) and based on the lack of differentiation markers of B cells (CD19 and CD20), T cells (CD3), monocytes (CD14) and natural killer cells (CD56), as determined using standard assays. Dendritic cells may, of course, be engineered to express specific cell-

surface receptors or ligands that are not commonly found on dendritic cells *in vivo* or *ex vivo*, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine (*see* Zitvogel et al., *Nature Med.* 4:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNF α to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNF α , CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fc γ receptor, mannose receptor and DEC-205 marker. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (*e.g.*, CD54 and CD11) and costimulatory molecules (*e.g.*, CD40, CD80 and CD86).

APCs may generally be transfected with a polynucleotide encoding a prostate tumor protein (or portion or other variant thereof) such that the prostate tumor polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place *ex vivo*, and a composition or vaccine comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection that occurs *in vivo*. *In vivo* and *ex vivo* transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi et al., *Immunology and cell Biology* 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the prostate tumor polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (*e.g.*, vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that

provides T cell help (e.g., a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

CANCER THERAPY

In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as prostate cancer. Within such methods, pharmaceutical compositions and vaccines are typically administered to a patient. As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions and vaccines may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. A cancer may be diagnosed using criteria generally accepted in the art, including the presence of a malignant tumor. Pharmaceutical compositions and vaccines may be administered either prior to or following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs.

Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (such as polypeptides and polynucleotides disclosed herein).

Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells include T cells as discussed above, T lymphocytes (such as CD8⁺ cytotoxic T lymphocytes and CD4⁺ T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody receptors specific for the polypeptides recited herein may be cloned, expressed and transferred into other vectors or effector cells for adoptive immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for adoptive immunotherapy by growth *in vitro*, as described herein. Culture conditions for expanding single antigen-specific effector cells to several billion in number with retention of antigen recognition *in vivo* are well known in the art. Such *in vitro* culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein

may be used to rapidly expand antigen-specific T cell cultures in order to generate a sufficient number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage, monocyte, fibroblast or B cells, may be pulsed with immunoreactive polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example, antigen-presenting cells can be transfected with a polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term *in vivo*. Studies have shown that cultured effector cells can be induced to grow *in vivo* and to survive long term in substantial numbers by repeated stimulation with antigen supplemented with IL-2 (*see, for example, Cheever et al., Immunological Reviews 157:177, 1997*).

Alternatively, a vector expressing a polypeptide recited herein may be introduced into antigen presenting cells taken from a patient and clonally propagated *ex vivo* for transplant back into the same patient. Transfected cells may be reintroduced into the patient using any means known in the art, preferably in sterile form by intravenous, intracavitary, intraperitoneal or intratumor administration.

Routes and frequency of administration of the therapeutic compositions disclosed herein, as well as dosage, will vary from individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and vaccines may be administered by injection (*e.g.*, intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (*e.g.*, by aspiration) or orally. Preferably, between 1 and 10 doses may be administered over a 52 week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (*i.e.*, untreated) level. Such response can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells *in vitro*. Such vaccines should also be capable of causing an immune response that leads to an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for pharmaceutical compositions and vaccines comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 100 μ g to 5 mg per kg of host. Suitable dose sizes will vary with the size of the patient, but will typically range from about 0.1 mL to about 5 mL.

In general, an appropriate dosage and treatment regimen provides the active compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit. Such

a response can be monitored by establishing an improved clinical outcome (e.g., more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to a prostate tumor protein generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

METHODS FOR DETECTING CANCER

In general, a cancer may be detected in a patient based on the presence of one or more prostate tumor proteins and/or polynucleotides encoding such proteins in a biological sample (for example, blood, sera, urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as prostate cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of antigen that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer. In general, a prostate tumor sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue

There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. See, e.g., Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the remainder of the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, such as an anti-immunoglobulin, protein G, protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with the immobilized binding

agent. Suitable polypeptides for use within such assays include full length prostate tumor proteins and portions thereof to which the binding agent binds, as described above.

The solid support may be any material known to those of ordinary skill in the art to which the tumor protein may be attached. For example, the solid support may be a test well in a microtiter plate or a nitrocellulose or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety of techniques known to those of skill in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption, and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a microtiter plate or to a membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of binding agent ranging from about 10 ng to about 10 μ g, and preferably about 100 ng to about 1 μ g, is sufficient to immobilize an adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (*see, e.g.*, Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

In certain embodiments, the assay is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a detection reagent (preferably a second antibody capable of binding to a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20™ (Sigma Chemical Co., St. Louis, MO). The immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (*i.e.*, incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with prostate cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will recognize that the time necessary to achieve equilibrium may be readily determined by assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20™. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

To determine the presence or absence of a cancer, such as prostate cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In one preferred embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred

embodiment, the cut-off value is determined using a Receiver Operator Curve, according to the method of Sackett et al., *Clinical Epidemiology: A Basic Science for Clinical Medicine*, Little Brown and Co., 1985, p. 106-7. Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (*i.e.*, sensitivity) and false positive rates (100%-specificity) that correspond to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (*i.e.*, the value that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered positive. Alternatively, the cut-off value may be shifted to the left along the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing the second binding agent flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second binding agent at the area of immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1 μ g, and more preferably from about 50 ng to about 500 ng. Such tests can typically be performed with a very small amount of biological sample.

Of course, numerous other assay protocols exist that are suitable for use with the tumor proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use prostate tumor polypeptides to

detect antibodies that bind to such polypeptides in a biological sample. The detection of such prostate tumor protein specific antibodies may correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with a prostate tumor protein in a biological sample. Within certain methods, a biological sample comprising CD4⁺ and/or CD8⁺ T cells isolated from a patient is incubated with a prostate tumor polypeptide, a polynucleotide encoding such a polypeptide and/or an APC that expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with prostate tumor polypeptide (*e.g.*, 5 - 25 µg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of prostate tumor polypeptide to serve as a control. For CD4⁺ T cells, activation is preferably detected by evaluating proliferation of the T cells. For CD8⁺ T cells, activation is preferably detected by evaluating cytolytic activity. A level of proliferation that is at least two fold greater and/or a level of cytolytic activity that is at least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

As noted above, a cancer may also, or alternatively, be detected based on the level of mRNA encoding a prostate tumor protein in a biological sample. For example, at least two oligonucleotide primers may be employed in a polymerase chain reaction (PCR) based assay to amplify a portion of a prostate tumor cDNA derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the prostate tumor protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to a polynucleotide encoding a prostate tumor protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the tumor protein in a biological sample.

To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%, preferably at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding a prostate tumor protein that is at least 10 nucleotides, and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes will hybridize to a polynucleotide encoding a polypeptide disclosed herein under moderately stringent conditions, as defined above. Oligonucleotide primers and/or probes which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers

comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence recited in SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375 and 381. Techniques for both PCR based assays and hybridization assays are well known in the art (*see*, for example, Mullis et al., *Cold Spring Harbor Symp. Quant. Biol.*, 51:263, 1987; Erlich ed., *PCR Technology*, Stockton Press, NY, 1989).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample, such as biopsy tissue, and is reverse transcribed to produce cDNA molecules. PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

In another embodiment, the disclosed compositions may be used as markers for the progression of cancer. In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) or polynucleotide evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide or polynucleotide detected increases over time. In contrast, the cancer is not progressing when the level of reactive polypeptide or polynucleotide either remains constant or decreases with time.

Certain *in vivo* diagnostic assays may be performed directly on a tumor. One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents may also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

As noted above, to improve sensitivity, multiple prostate tumor protein markers may be assayed within a given sample. It will be apparent that binding agents specific for different proteins provided herein may be combined within a single assay. Further, multiple primers or probes may be used concurrently. The selection of tumor protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for tumor proteins provided herein may be combined with assays for other known tumor antigens.

DIAGNOSTIC KITS

The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or equipment. For example, one container within a kit may contain a monoclonal antibody or fragment thereof that specifically binds to a prostate tumor protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection reagent as described above that contains a reporter group suitable for direct or indirect detection of antibody binding.

Alternatively, a kit may be designed to detect the level of mRNA encoding a prostate tumor protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a polynucleotide encoding a prostate tumor protein. Such an oligonucleotide may be used, for example, within a PCR or hybridization assay. Additional components that may be present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding a prostate tumor protein.

The following Examples are offered by way of illustration and not by way of limitation.

EXAMPLES

EXAMPLE 1

ISOLATION AND CHARACTERIZATION OF PROSTATE TUMOR POLYPEPTIDES

This Example describes the isolation of certain prostate tumor polypeptides from a prostate tumor cDNA library.

A human prostate tumor cDNA expression library was constructed from prostate tumor poly A⁺ RNA using a Superscript Plasmid System for cDNA Synthesis and Plasmid Cloning kit (BRL Life Technologies, Gaithersburg, MD 20897) following the manufacturer's protocol. Specifically, prostate tumor tissues were homogenized with polytron (Kinematica, Switzerland) and total RNA was extracted using Trizol reagent (BRL Life Technologies) as directed by the manufacturer. The poly A⁺ RNA was then purified using a Qiagen oligotex spin column mRNA purification kit (Qiagen, Santa Clarita, CA 91355) according to the manufacturer's protocol. First-strand cDNA was synthesized using the NotI/Oligo-dT18 primer. Double-stranded cDNA was synthesized, ligated with EcoRI/BAXI adaptors (Invitrogen, San Diego, CA) and digested with NotI. Following size fractionation with Chroma Spin-1000 columns (Clontech, Palo Alto, CA), the cDNA was ligated into the EcoRI/NotI site of pCDNA3.1 (Invitrogen) and transformed into ElectroMax *E. coli* DH10B cells (BRL Life Technologies) by electroporation.

Using the same procedure, a normal human pancreas cDNA expression library was prepared from a pool of six tissue specimens (Clontech). The cDNA libraries were characterized by determining the number of independent colonies, the percentage of clones that carried insert, the average insert size and by sequence analysis. The prostate tumor library contained 1.64×10^7 independent colonies, with 70% of clones having an insert and the average insert size being 1745 base pairs. The normal pancreas cDNA library contained 3.3×10^6 independent colonies, with 69% of clones having inserts and the average insert size being 1120 base pairs. For both libraries, sequence analysis showed that the majority of clones had a full length cDNA sequence and were synthesized from mRNA, with minimal rRNA and mitochondrial DNA contamination.

cDNA library subtraction was performed using the above prostate tumor and normal pancreas cDNA libraries, as described by Hara *et al.* (*Blood*, 84:189-199, 1994) with some modifications. Specifically, a prostate tumor-specific subtracted cDNA library was generated as follows. Normal pancreas cDNA library (70 μ g) was digested with EcoRI, NotI, and SfuI, followed by a filling-in reaction with DNA polymerase Klenow fragment. After phenol-chloroform extraction and ethanol precipitation, the DNA was dissolved in 100 μ l of

H₂O, heat-denatured and mixed with 100 µl (100 µg) of Photoprobe biotin (Vector Laboratories, Burlingame, CA). As recommended by the manufacturer, the resulting mixture was irradiated with a 270 W sunlamp on ice for 20 minutes. Additional Photoprobe biotin (50 µl) was added and the biotinylation reaction was repeated. After extraction with butanol five times, the DNA was ethanol-precipitated and dissolved in 23 µl H₂O to form the driver DNA.

To form the tracer DNA, 10 µg prostate tumor cDNA library was digested with BamHI and XhoI, phenol chloroform extracted and passed through Chroma spin-400 columns (Clontech). Following ethanol precipitation, the tracer DNA was dissolved in 5 µl H₂O. Tracer DNA was mixed with 15 µl driver DNA and 20 µl of 2 x hybridization buffer (1.5 M NaCl/10 mM EDTA/50 mM HEPES pH 7.5/0.2% sodium dodecyl sulfate), overlaid with mineral oil, and heat-denatured completely. The sample was immediately transferred into a 68 °C water bath and incubated for 20 hours (long hybridization [LH]). The reaction mixture was then subjected to a streptavidin treatment followed by phenol/chloroform extraction. This process was repeated three more times. Subtracted DNA was precipitated, dissolved in 12 µl H₂O, mixed with 8 µl driver DNA and 20 µl of 2 x hybridization buffer, and subjected to a hybridization at 68 °C for 2 hours (short hybridization [SH]). After removal of biotinylated double-stranded DNA, subtracted cDNA was ligated into BamHI/XhoI site of chloramphenicol resistant pBCSK⁺ (Stratagene, La Jolla, CA 92037) and transformed into ElectroMax *E. coli* DH10B cells by electroporation to generate a prostate tumor specific subtracted cDNA library (referred to as "prostate subtraction 1").

To analyze the subtracted cDNA library, plasmid DNA was prepared from 100 independent clones, randomly picked from the subtracted prostate tumor specific library and grouped based on insert size. Representative cDNA clones were further characterized by DNA sequencing with a Perkin Elmer/Applied Biosystems Division Automated Sequencer Model 373A (Foster City, CA). Six cDNA clones, hereinafter referred to as F1-13, F1-12, F1-16, H1-1, H1-9 and H1-4, were shown to be abundant in the subtracted prostate-specific cDNA library. The determined 3' and 5' cDNA sequences for F1-12 are provided in SEQ ID NO: 2 and 3, respectively, with determined 3' cDNA sequences for F1-13, F1-16, H1-1, H1-9 and H1-4 being provided in SEQ ID NO: 1 and 4-7, respectively.

The cDNA sequences for the isolated clones were compared to known sequences in the gene bank using the EMBL and GenBank databases (release 96). Four of the prostate tumor cDNA clones, F1-13, F1-16, H1-1, and H1-4, were determined to encode the following previously identified proteins: prostate specific antigen (PSA), human glandular kallikrein, human tumor expression enhanced gene, and mitochondria cytochrome C oxidase subunit II. H1-9 was found to be identical to a previously identified human

autonomously replicating sequence. No significant homologies to the cDNA sequence for F1-12 were found.

Subsequent studies led to the isolation of a full-length cDNA sequence for F1-12. This sequence is provided in SEQ ID NO: 107, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 108.

To clone less abundant prostate tumor specific genes, cDNA library subtraction was performed by subtracting the prostate tumor cDNA library described above with the normal pancreas cDNA library and with the three most abundant genes in the previously subtracted prostate tumor specific cDNA library: human glandular kallikrein, prostate specific antigen (PSA), and mitochondria cytochrome C oxidase subunit II. Specifically, 1 µg each of human glandular kallikrein, PSA and mitochondria cytochrome C oxidase subunit II cDNAs in pCDNA3.1 were added to the driver DNA and subtraction was performed as described above to provide a second subtracted cDNA library hereinafter referred to as the "subtracted prostate tumor specific cDNA library with spike".

Twenty-two cDNA clones were isolated from the subtracted prostate tumor specific cDNA library with spike. The determined 3' and 5' cDNA sequences for the clones referred to as J1-17, L1-12, N1-1862, J1-13, J1-19, J1-25, J1-24, K1-58, K1-63, L1-4 and L1-14 are provided in SEQ ID NOS: 8-9, 10-11, 12-13, 14-15, 16-17, 18-19, 20-21, 22-23, 24-25, 26-27 and 28-29, respectively. The determined 3' cDNA sequences for the clones referred to as J1-12, J1-16, J1-21, K1-48, K1-55, L1-2, L1-6, N1-1858, N1-1860, N1-1861, N1-1864 are provided in SEQ ID NOS: 30-40, respectively. Comparison of these sequences with those in the gene bank as described above, revealed no significant homologies to three of the five most abundant DNA species, (J1-17, L1-12 and N1-1862; SEQ ID NOS: 8-9, 10-11 and 12-13, respectively). Of the remaining two most abundant species, one (J1-12; SEQ ID NO:30) was found to be identical to the previously identified human pulmonary surfactant-associated protein, and the other (K1-48; SEQ ID NO:33) was determined to have some homology to *R. norvegicus* mRNA for 2-arylpropionyl-CoA epimerase. Of the 17 less abundant cDNA clones isolated from the subtracted prostate tumor specific cDNA library with spike, four (J1-16, K1-55, L1-6 and N1-1864; SEQ ID NOS:31, 34, 36 and 40, respectively) were found to be identical to previously identified sequences, two (J1-21 and N1-1860; SEQ ID NOS: 32 and 38, respectively) were found to show some homology to non-human sequences, and two (L1-2 and N1-1861; SEQ ID NOS: 35 and 39, respectively) were found to show some homology to known human sequences. No significant homologies were found to the polypeptides J1-13, J1-19, J1-24, J1-25, K1-58, K1-63, L1-4, L1-14 (SEQ ID NOS: 14-15, 16-17, 20-21, 18-19, 22-23, 24-25, 26-27, 28-29, respectively).

Subsequent studies led to the isolation of full length cDNA sequences for J1-17, L1-12 and N1-1862 (SEQ ID NOS: 109-111, respectively). The corresponding predicted

amino acid sequences are provided in SEQ ID NOS: 112-114. L1-12 is also referred to as P501S.

In a further experiment, four additional clones were identified by subtracting a prostate tumor cDNA library with normal prostate cDNA prepared from a pool of three normal prostate poly A+ RNA (referred to as "prostate subtraction 2"). The determined cDNA sequences for these clones, hereinafter referred to as U1-3064, U1-3065, V1-3692 and 1A-3905, are provided in SEQ ID NO: 69-72, respectively. Comparison of the determined sequences with those in the gene bank revealed no significant homologies to U1-3065.

A second subtraction with spike (referred to as "prostate subtraction spike 2") was performed by subtracting a prostate tumor specific cDNA library with spike with normal pancreas cDNA library and further spiked with PSA, J1-17, pulmonary surfactant-associated protein, mitochondrial DNA, cytochrome c oxidase subunit II, N1-1862, autonomously replicating sequence, L1-12 and tumor expression enhanced gene. Four additional clones, hereinafter referred to as V1-3686, R1-2330, 1B-3976 and V1-3679, were isolated. The determined cDNA sequences for these clones are provided in SEQ ID NO: 73-76, respectively. Comparison of these sequences with those in the gene bank revealed no significant homologies to V1-3686 and R1-2330.

Further analysis of the three prostate subtractions described above (prostate subtraction 2, subtracted prostate tumor specific cDNA library with spike, and prostate subtraction spike 2) resulted in the identification of sixteen additional clones, referred to as 1G-4736, 1G-4738, 1G-4741, 1G-4744, 1G-4734, 1H-4774, 1H-4781, 1H-4785, 1H-4787, 1H-4796, 1I-4810, 1I-4811, 1J-4876, 1K-4884 and 1K-4896. The determined cDNA sequences for these clones are provided in SEQ ID NOS: 77-92, respectively. Comparison of these sequences with those in the gene bank as described above, revealed no significant homologies to 1G-4741, 1G-4734, 1I-4807, 1J-4876 and 1K-4896 (SEQ ID NOS: 79, 81, 87, 90 and 92, respectively). Further analysis of the isolated clones led to the determination of extended cDNA sequences for 1G-4736, 1G-4738, 1G-4741, 1G-4744, 1H-4774, 1H-4781, 1H-4785, 1H-4787, 1H-4796, 1I-4807, 1J-4876, 1K-4884 and 1K-4896, provided in SEQ ID NOS: 179-188 and 191-193, respectively, and to the determination of additional partial cDNA sequences for 1I-4810 and 1I-4811, provided in SEQ ID NOS: 189 and 190, respectively.

Additional studies with prostate subtraction spike 2 resulted in the isolation of three more clones. Their sequences were determined as described above and compared to the most recent GenBank. All three clones were found to have homology to known genes, which are Cysteine-rich protein, KIAA0242, and KIAA0280 (SEQ ID NO: 317, 319, and 320, respectively). Further analysis of these clones by Synteni microarray (Synteni, Palo Alto, CA) demonstrated that all three clones were over-expressed in most prostate tumors and

prostate BPH, as well as in the majority of normal prostate tissues tested, but low expression in all other normal tissues.

An additional subtraction was performed by subtracting a normal prostate cDNA library with normal pancreas cDNA (referred to as "prostate subtraction 3"). This led to the identification of six additional clones referred to as 1G-4761, 1G-4762, 1H-4766, 1H-4770, 1H-4771 and 1H-4772 (SEQ ID NOS: 93-98). Comparison of these sequences with those in the gene bank revealed no significant homologies to 1G-4761 and 1H-4771 (SEQ ID NOS: 93 and 97, respectively). Further analysis of the isolated clones led to the determination of extended cDNA sequences for 1G-4761, 1G-4762, 1H-4766 and 1H-4772 provided in SEQ ID NOS: 194-196 and 199, respectively, and to the determination of additional partial cDNA sequences for 1H-4770 and 1H-4771, provided in SEQ ID NOS: 197 and 198, respectively.

Subtraction of a prostate tumor cDNA library, prepared from a pool of polyA+ RNA from three prostate cancer patients, with a normal pancreas cDNA library (prostate subtraction 4) led to the identification of eight clones, referred to as 1D-4297, 1D-4309, 1D.1-4278, 1D-4288, 1D-4283, 1D-4304, 1D-4296 and 1D-4280 (SEQ ID NOS: 99-107). These sequences were compared to those in the gene bank as described above. No significant homologies were found to 1D-4283 and 1D-4304 (SEQ ID NOS: 103 and 104, respectively). Further analysis of the isolated clones led to the determination of extended cDNA sequences for 1D-4309, 1D.1-4278, 1D-4288, 1D-4283, 1D-4304, 1D-4296 and 1D-4280, provided in SEQ ID NOS: 200-206, respectively.

cDNA clones isolated in prostate subtraction 1 and prostate subtraction 2, described above, were colony PCR amplified and their mRNA expression levels in prostate tumor, normal prostate and in various other normal tissues were determined using microarray technology (Synteni, Palo Alto, CA). Briefly, the PCR amplification products were dotted onto slides in an array format, with each product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, reverse transcribed, and fluorescent-labeled cDNA probes were generated. The microarrays were probed with the labeled cDNA probes, the slides scanned and fluorescence intensity was measured. This intensity correlates with the hybridization intensity. Two clones (referred to as P509S and P510S) were found to be over-expressed in prostate tumor and normal prostate and expressed at low levels in all other normal tissues tested (liver, pancreas, skin, bone marrow, brain, breast, adrenal gland, bladder, testes, salivary gland, large intestine, kidney, ovary, lung, spinal cord, skeletal muscle and colon). The determined cDNA sequences for P509S and P510S are provided in SEQ ID NO: 223 and 224, respectively. Comparison of these sequences with those in the gene bank as described above, revealed some homology to previously identified ESTs.

Additional, studies led to the isolation of the full-length cDNA sequence for P509S. This sequence is provided in SEQ ID NO: 332, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 339.

EXAMPLE 2

DETERMINATION OF TISSUE SPECIFICITY OF PROSTATE TUMOR POLYPEPTIDES

Using gene specific primers, mRNA expression levels for the representative prostate tumor polypeptides F1-16, H1-1, J1-17 (also referred to as P502S), L1-12 (also referred to as P501S), F1-12 (also referred to as P504S) and N1-1862 (also referred to as P503S) were examined in a variety of normal and tumor tissues using RT-PCR.

Briefly, total RNA was extracted from a variety of normal and tumor tissues using Trizol reagent as described above. First strand synthesis was carried out using 1-2 μ g of total RNA with SuperScript II reverse transcriptase (BRL Life Technologies) at 42 °C for one hour. The cDNA was then amplified by PCR with gene-specific primers. To ensure the semi-quantitative nature of the RT-PCR, β -actin was used as an internal control for each of the tissues examined. First, serial dilutions of the first strand cDNAs were prepared and RT-PCR assays were performed using β -actin specific primers. A dilution was then chosen that enabled the linear range amplification of the β -actin template and which was sensitive enough to reflect the differences in the initial copy numbers. Using these conditions, the β -actin levels were determined for each reverse transcription reaction from each tissue. DNA contamination was minimized by DNase treatment and by assuring a negative PCR result when using first strand cDNA that was prepared without adding reverse transcriptase.

mRNA Expression levels were examined in four different types of tumor tissue (prostate tumor from 2 patients, breast tumor from 3 patients, colon tumor, lung tumor), and sixteen different normal tissues, including prostate, colon, kidney, liver, lung, ovary, pancreas, skeletal muscle, skin, stomach, testes, bone marrow and brain. F1-16 was found to be expressed at high levels in prostate tumor tissue, colon tumor and normal prostate, and at lower levels in normal liver, skin and testes, with expression being undetectable in the other tissues examined. H1-1 was found to be expressed at high levels in prostate tumor, lung tumor, breast tumor, normal prostate, normal colon and normal brain, at much lower levels in normal lung, pancreas, skeletal muscle, skin, small intestine, bone marrow, and was not detected in the other tissues tested. J1-17 (P502S) and L1-12 (P501S) appear to be specifically over-expressed in prostate, with both genes being expressed at high levels in prostate tumor and normal prostate but at low to undetectable levels in all the other tissues examined. N1-1862 (P503S) was found to be over-expressed in 60% of prostate tumors and detectable in normal colon and kidney. The RT-PCR results thus indicate that

F1-16, H1-1, J1-17 (P502S), N1-1862 (P503S) and L1-12 (P501S) are either prostate specific or are expressed at significantly elevated levels in prostate.

Further RT-PCR studies showed that F1-12 (P504S) is over-expressed in 60% of prostate tumors, detectable in normal kidney but not detectable in all other tissues tested. Similarly, R1-2330 was shown to be over-expressed in 40% of prostate tumors, detectable in normal kidney and liver, but not detectable in all other tissues tested. U1-3064 was found to be over-expressed in 60% of prostate tumors, and also expressed in breast and colon tumors, but was not detectable in normal tissues.

RT-PCR characterization of R1-2330, U1-3064 and 1D-4279 showed that these three antigens are over-expressed in prostate and/or prostate tumors.

Northern analysis with four prostate tumors, two normal prostate samples, two BPH prostates, and normal colon, kidney, liver, lung, pancreas, skeletal muscle, brain, stomach, testes, small intestine and bone marrow, showed that L1-12 (P501S) is over-expressed in prostate tumors and normal prostate, while being undetectable in other normal tissues tested. J1-17 (P502S) was detected in two prostate tumors and not in the other tissues tested. N1-1862 (P503S) was found to be over-expressed in three prostate tumors and to be expressed in normal prostate, colon and kidney, but not in other tissues tested. F1-12 (P504S) was found to be highly expressed in two prostate tumors and to be undetectable in all other tissues tested.

The microarray technology described above was used to determine the expression levels of representative antigens described herein in prostate tumor, breast tumor and the following normal tissues: prostate, liver, pancreas, skin, bone marrow, brain, breast, adrenal gland, bladder, testes, salivary gland, large intestine, kidney, ovary, lung, spinal cord, skeletal muscle and colon. L1-12 (P501S) was found to be over-expressed in normal prostate and prostate tumor, with some expression being detected in normal skeletal muscle. Both J1-12 and F1-12 (P504S) were found to be over-expressed in prostate tumor, with expression being lower or undetectable in all other tissues tested. N1-1862 (P503S) was found to be expressed at high levels in prostate tumor and normal prostate, and at low levels in normal large intestine and normal colon, with expression being undetectable in all other tissues tested. R1-2330 was found to be over-expressed in prostate tumor and normal prostate, and to be expressed at lower levels in all other tissues tested. 1D-4279 was found to be over-expressed in prostate tumor and normal prostate, expressed at lower levels in normal spinal cord, and to be undetectable in all other tissues tested.

Further microarray analysis to specifically address the extent to which P501S (SEQ ID NO: 110) was expressed in breast tumor revealed moderate over-expression not only in breast tumor, but also in metastatic breast tumor (2/31), with negligible to low expression

in normal tissues. This data suggests that P501S may be over-expressed in various breast tumors as well as in prostate tumors.

The expression levels of 32 ESTs (expressed sequence tags) described by Vasmatzis *et al.* (*Proc. Natl. Acad. Sci. USA* 95:300-304, 1998) in a variety of tumor and normal tissues were examined by microarray technology as described above. Two of these clones (referred to as P1000C and P1001C) were found to be over-expressed in prostate tumor and normal prostate, and expressed at low to undetectable levels in all other tissues tested (normal aorta, thymus, resting and activated PBMC, epithelial cells, spinal cord, adrenal gland, fetal tissues, skin, salivary gland, large intestine, bone marrow, liver, lung, dendritic cells, stomach, lymph nodes, brain, heart, small intestine, skeletal muscle, colon and kidney). The determined cDNA sequences for P1000C and P1001C are provided in SEQ ID NO: 384 and 472, respectively. The sequence of P1001C was found to show some homology to the previously isolated Human mRNA for JM27 protein. No significant homologies were found to the sequence of P1000C.

The expression of the polypeptide encoded by the full length cDNA sequence for F1-12 (also referred to as P504S; SEQ ID NO: 108) was investigated by immunohistochemical analysis. Rabbit-anti-P504S polyclonal antibodies were generated against the full length P504S protein by standard techniques. Subsequent isolation and characterization of the polyclonal antibodies were also performed by techniques well known in the art. Immunohistochemical analysis showed that the P504S polypeptide was expressed in 100% of prostate carcinoma samples tested (n=5).

The rabbit-anti-P504S polyclonal antibody did not appear to label benign prostate cells with the same cytoplasmic granular staining, but rather with light nuclear staining. Analysis of normal tissues revealed that the encoded polypeptide was found to be expressed in some, but not all normal human tissues. Positive cytoplasmic staining with rabbit-anti-P504S polyclonal antibody was found in normal human kidney, liver, brain, colon and lung-associated macrophages, whereas heart and bone marrow were negative.

This data indicates that the P504S polypeptide is present in prostate cancer tissues, and that there are qualitative and quantitative differences in the staining between benign prostatic hyperplasia tissues and prostate cancer tissues, suggesting that this polypeptide may be detected selectively in prostate tumors and therefore be useful in the diagnosis of prostate cancer.

EXAMPLE 3

ISOLATION AND CHARACTERIZATION OF PROSTATE TUMOR POLYPEPTIDES BY PCR-BASED SUBTRACTION

A cDNA subtraction library, containing cDNA from normal prostate subtracted with ten other normal tissue cDNAs (brain, heart, kidney, liver, lung, ovary, placenta, skeletal muscle, spleen and thymus) and then submitted to a first round of PCR amplification, was purchased from Clontech. This library was subjected to a second round of PCR amplification, following the manufacturer's protocol. The resulting cDNA fragments were subcloned into the vector pT7 Blue T-vector (Novagen, Madison, WI) and transformed into XL-1 Blue MRF' *E. coli* (Stratagene). DNA was isolated from independent clones and sequenced using a Perkin Elmer/Applied Biosystems Division Automated Sequencer Model 373A.

Fifty-nine positive clones were sequenced. Comparison of the DNA sequences of these clones with those in the gene bank, as described above, revealed no significant homologies to 25 of these clones, hereinafter referred to as P5, P8, P9, P18, P20, P30, P34, P36, P38, P39, P42, P49, P50, P53, P55, P60, P64, P65, P73, P75, P76, P79 and P84. The determined cDNA sequences for these clones are provided in SEQ ID NO: 41-45, 47-52 and 54-65, respectively. P29, P47, P68, P80 and P82 (SEQ ID NO: 46, 53 and 66-68, respectively) were found to show some degree of homology to previously identified DNA sequences. To the best of the inventors' knowledge, none of these sequences have been previously shown to be present in prostate.

Further studies using the PCR-based methodology described above resulted in the isolation of more than 180 additional clones, of which 23 clones were found to show no significant homologies to known sequences. The determined cDNA sequences for these clones are provided in SEQ ID NO: 115-123, 127, 131, 137, 145, 147-151, 153, 156-158 and 160. Twenty-three clones (SEQ ID NO: 124-126, 128-130, 132-136, 138-144, 146, 152, 154, 155 and 159) were found to show some homology to previously identified ESTs. An additional ten clones (SEQ ID NO: 161-170) were found to have some degree of homology to known genes. Larger cDNA clones containing the P20 sequence represent splice variants of a gene referred to as P703P. The determined DNA sequence for the variants referred to as DE1, DE13 and DE14 are provided in SEQ ID NOS: 171, 175 and 177, respectively, with the corresponding predicted amino acid sequences being provided in SEQ ID NO: 172, 176 and 178, respectively. The determined cDNA sequence for an extended spliced form of P703 is provided in SEQ ID NO: 225. The DNA sequences for the splice variants referred to as DE2 and DE6 are provided in SEQ ID NOS: 173 and 174, respectively.

mRNA Expression levels for representative clones in tumor tissues (prostate (n=5), breast (n=2), colon and lung) normal tissues (prostate (n=5), colon, kidney, liver, lung (n=2), ovary (n=2), skeletal muscle, skin, stomach, small intestine and brain), and activated

and non-activated PBMC was determined by RT-PCR as described above. Expression was examined in one sample of each tissue type unless otherwise indicated.

P9 was found to be highly expressed in normal prostate and prostate tumor compared to all normal tissues tested except for normal colon which showed comparable expression. P20, a portion of the P703P gene, was found to be highly expressed in normal prostate and prostate tumor, compared to all twelve normal tissues tested. A modest increase in expression of P20 in breast tumor (n=2), colon tumor and lung tumor was seen compared to all normal tissues except lung (1 of 2). Increased expression of P18 was found in normal prostate, prostate tumor and breast tumor compared to other normal tissues except lung and stomach. A modest increase in expression of P5 was observed in normal prostate compared to most other normal tissues. However, some elevated expression was seen in normal lung and PBMC. Elevated expression of P5 was also observed in prostate tumors (2 of 5), breast tumor and one lung tumor sample. For P30, similar expression levels were seen in normal prostate and prostate tumor, compared to six of twelve other normal tissues tested. Increased expression was seen in breast tumors, one lung tumor sample and one colon tumor sample, and also in normal PBMC. P29 was found to be over-expressed in prostate tumor (5 of 5) and normal prostate (5 of 5) compared to the majority of normal tissues. However, substantial expression of P29 was observed in normal colon and normal lung (2 of 2). P80 was found to be over-expressed in prostate tumor (5 of 5) and normal prostate (5 of 5) compared to all other normal tissues tested, with increased expression also being seen in colon tumor.

Further studies resulted in the isolation of twelve additional clones, hereinafter referred to as 10-d8, 10-h10, 11-c8, 7-g6, 8-b5, 8-b6, 8-d4, 8-d9, 8-g3, 8-h11, 9-f12 and 9-f3. The determined DNA sequences for 10-d8, 10-h10, 11-c8, 8-d4, 8-d9, 8-h11, 9-f12 and 9-f3 are provided in SEQ ID NO: 207, 208, 209, 216, 217, 220, 221 and 222, respectively. The determined forward and reverse DNA sequences for 7-g6, 8-b5, 8-b6 and 8-g3 are provided in SEQ ID NO: 210 and 211; 212 and 213; 214 and 215; and 218 and 219, respectively. Comparison of these sequences with those in the gene bank revealed no significant homologies to the sequence of 9-f3. The clones 10-d8, 11-c8 and 8-h11 were found to show some homology to previously isolated ESTs, while 10-h10, 8-b5, 8-b6, 8-d4, 8-d9, 8-g3 and 9-f12 were found to show some homology to previously identified genes. Further characterization of 7-G6 and 8-G3 showed identity to the known genes PAP and PSA, respectively.

mRNA expression levels for these clones were determined using the microarray technology described above. The clones 7-G6, 8-G3, 8-B5, 8-B6, 8-D4, 8-D9, 9-F3, 9-F12, 9-H3, 10-A2, 10-A4, 11-C9 and 11-F2 were found to be over-expressed in prostate tumor and normal prostate, with expression in other tissues tested being low or undetectable.

Increased expression of 8-F11 was seen in prostate tumor and normal prostate, bladder, skeletal muscle and colon. Increased expression of 10-H10 was seen in prostate tumor and normal prostate, bladder, lung, colon, brain and large intestine. Increased expression of 9-B1 was seen in prostate tumor, breast tumor, and normal prostate, salivary gland, large intestine and skin, with increased expression of 11-C8 being seen in prostate tumor, and normal prostate and large intestine.

An additional cDNA fragment derived from the PCR-based normal prostate subtraction, described above, was found to be prostate specific by both micro-array technology and RT-PCR. The determined cDNA sequence of this clone (referred to as 9-A11) is provided in SEQ ID NO: 226. Comparison of this sequence with those in the public databases revealed 99% identity to the known gene HOXB13.

Further studies led to the isolation of the clones 8-C6 and 8-H7. The determined cDNA sequences for these clones are provided in SEQ ID NO: 227 and 228, respectively. These sequences were found to show some homology to previously isolated ESTs.

PCR and hybridization-based methodologies were employed to obtain longer cDNA sequences for clone P20 (also referred to as P703P), yielding three additional cDNA fragments that progressively extend the 5' end of the gene. These fragments, referred to as P703PDE5, P703P6.26, and P703PX-23 (SEQ ID NO: 326, 328 and 330, with the predicted corresponding amino acid sequences being provided in SEQ ID NO: 327, 329 and 331, respectively) contain additional 5' sequence. P703PDE5 was recovered by screening of a cDNA library (#141-26) with a portion of P703P as a probe. P703P6.26 was recovered from a mixture of three prostate tumor cDNAs and P703PX_23 was recovered from cDNA library (#438-48). Together, the additional sequences include all of the putative mature serine protease along with part of the putative signal sequence. Further studies using a PCR-based subtraction library of a prostate tumor pool subtracted against a pool of normal tissues (referred to as JP: PCR subtraction) resulted in the isolation of thirteen additional clones, seven of which did not share any significant homology to known GenBank sequences. The determined cDNA sequences for these seven clones (P711P, P712P, novel 23, P774P, P775P, P710P and P768P) are provided in SEQ ID NO: 307-311, 313 and 315, respectively. The remaining six clones (SEQ ID NO: 316 and 321-325) were shown to share some homology to known genes. By microarray analysis, all thirteen clones showed three or more fold over-expression in prostate tissues, including prostate tumors, BPH and normal prostate as compared to normal non-prostate tissues. Clones P711P, P712P, novel 23 and P768P showed over-expression in most prostate tumors and BPH tissues tested (n=29), and in the majority of normal prostate tissues (n=4), but background to low expression levels in all normal tissues.

Clones P774P, P775P and P710P showed comparatively lower expression and expression in fewer prostate tumors and BPH samples, with negative to low expression in normal prostate.

The full-length cDNA for P711P was obtained by employing the partial sequence of SEQ ID NO: 307 to screen a prostate cDNA library. Specifically, a directionally cloned prostate cDNA library was prepared using standard techniques. One million colonies of this library were plated onto LB/Amp plates. Nylon membrane filters were used to lift these colonies, and the cDNAs which were picked up by these filters were denatured and cross-linked to the filters by UV light. The P711P cDNA fragment of SEQ ID NO: 307 was radio-labeled and used to hybridize with these filters. Positive clones were selected, and cDNAs were prepared and sequenced using an automatic Perkin Elmer/Applied Biosystems sequencer. The determined full-length sequence of P711P is provided in SEQ ID NO: 382, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 383.

Using PCR and hybridization-based methodologies, additional cDNA sequence information was derived for two clones described above, 11-C9 and 9-F3, herein after referred to as P707P and P714P, respectively (SEQ ID NO: 333 and 334). After comparison with the most recent GenBank, P707P was found to be a splice variant of the known gene HoxB13. In contrast, no significant homologies to P714P were found.

Clones 8-B3, P89, P98, P130 and P201 (as disclosed in U.S. Patent Application No. 09/020,956, filed February 9, 1998) were found to be contained within one contiguous sequence, referred to as P705P (SEQ ID NO: 335, with the predicted amino acid sequence provided in SEQ ID NO: 336), which was determined to be a splice variant of the known gene NKX 3.1.

EXAMPLE 4 SYNTHESIS OF POLYPEPTIDES

Polypeptides may be synthesized on a Perkin Elmer/Applied Biosystems 430A peptide synthesizer using Fmoc chemistry with HPTU (O-Benzotriazole-N,N,N',N'-tetramethyluronium hexafluorophosphate) activation. A Gly-Cys-Gly sequence may be attached to the amino terminus of the peptide to provide a method of conjugation, binding to an immobilized surface, or labeling of the peptide. Cleavage of the peptides from the solid support may be carried out using the following cleavage mixture: trifluoroacetic acid:ethanedithiol:thioanisole:water:phenol (40:1:2:2:3). After cleaving for 2 hours, the peptides may be precipitated in cold methyl-t-butyl-ether. The peptide pellets may then be dissolved in water containing 0.1% trifluoroacetic acid (TFA) and lyophilized prior to purification by C18 reverse phase HPLC. A gradient of 0%-60% acetonitrile (containing 0.1% TFA) in water (containing 0.1% TFA) may be used to elute the peptides. Following

lyophilization of the pure fractions, the peptides may be characterized using electrospray or other types of mass spectrometry and by amino acid analysis.

EXAMPLE 5

FURTHER ISOLATION AND CHARACTERIZATION OF PROSTATE TUMOR POLYPEPTIDES BY PCR-BASED SUBTRACTION

A cDNA library generated from prostate primary tumor mRNA as described above was subtracted with cDNA from normal prostate. The subtraction was performed using a PCR-based protocol (Clontech), which was modified to generate larger fragments. Within this protocol, tester and driver double stranded cDNA were separately digested with five restriction enzymes that recognize six-nucleotide restriction sites (MluI, MscI, PvuII, SalI and StuI). This digestion resulted in an average cDNA size of 600 bp, rather than the average size of 300 bp that results from digestion with RsaI according to the Clontech protocol. This modification did not affect the subtraction efficiency. Two tester populations were then created with different adapters, and the driver library remained without adapters.

The tester and driver libraries were then hybridized using excess driver cDNA. In the first hybridization step, driver was separately hybridized with each of the two tester cDNA populations. This resulted in populations of (a) unhybridized tester cDNAs, (b) tester cDNAs hybridized to other tester cDNAs, (c) tester cDNAs hybridized to driver cDNAs and (d) unhybridized driver cDNAs. The two separate hybridization reactions were then combined, and rehybridized in the presence of additional denatured driver cDNA. Following this second hybridization, in addition to populations (a) through (d), a fifth population (e) was generated in which tester cDNA with one adapter hybridized to tester cDNA with the second adapter. Accordingly, the second hybridization step resulted in enrichment of differentially expressed sequences which could be used as templates for PCR amplification with adaptor-specific primers.

The ends were then filled in, and PCR amplification was performed using adaptor-specific primers. Only population (e), which contained tester cDNA that did not hybridize to driver cDNA, was amplified exponentially. A second PCR amplification step was then performed, to reduce background and further enrich differentially expressed sequences.

This PCR-based subtraction technique normalizes differentially expressed cDNAs so that rare transcripts that are overexpressed in prostate tumor tissue may be recoverable. Such transcripts would be difficult to recover by traditional subtraction methods.

In addition to genes known to be overexpressed in prostate tumor, seventy-seven further clones were identified. Sequences of these partial cDNAs are provided in SEQ ID NO: 29 to 305. Most of these clones had no significant homology to database sequences. Exceptions were JTPN23 (SEQ ID NO: 231; similarity to pig valosin-containing protein), JTPN30 (SEQ ID NO: 234; similarity to rat mRNA for proteasome subunit), JTPN45 (SEQ ID NO: 243; similarity to rat *norvegicus* cytosolic NADP-dependent isocitrate dehydrogenase), JTPN46 (SEQ ID NO: 244; similarity to human subclone H8 4 d4 DNA sequence), JP1D6 (SEQ ID NO: 265; similarity to *G. gallus* dynein light chain-A), JP8D6 (SEQ ID NO: 288; similarity to human BAC clone RG016J04), JP8F5 (SEQ ID NO: 289; similarity to human subclone H8 3 b5 DNA sequence), and JP8E9 (SEQ ID NO: 299; similarity to human Alu sequence).

Additional studies using the PCR-based subtraction library consisting of a prostate tumor pool subtracted against a normal prostate pool (referred to as PT-PN PCR subtraction) yielded three additional clones. Comparison of the cDNA sequences of these clones with the most recent release of GenBank revealed no significant homologies to the two clones referred to as P715P and P767P (SEQ ID NO: 312 and 314). The remaining clone was found to show some homology to the known gene KIAA0056 (SEQ ID NO: 318). Using microarray analysis to measure mRNA expression levels in various tissues, all three clones were found to be over-expressed in prostate tumors and BPH tissues. Specifically, clone P715P was over-expressed in most prostate tumors and BPH tissues by a factor of three or greater, with elevated expression seen in the majority of normal prostate samples and in fetal tissue, but negative to low expression in all other normal tissues. Clone P767P was over-expressed in several prostate tumors and BPH tissues, with moderate expression levels in half of the normal prostate samples, and background to low expression in all other normal tissues tested.

Further analysis, by microarray as described above, of the PT-PN PCR subtraction library and of a DNA subtraction library containing cDNA from prostate tumor subtracted with a pool of normal tissue cDNAs, led to the isolation of 27 additional clones (SEQ ID NO: 340-365 and 381) which were determined to be over-expressed in prostate tumor. The clones of SEQ ID NO: 341, 342, 345, 347, 348, 349, 351, 355-359, 361, 362 and 364 were also found to be expressed in normal prostate. Expression of all 26 clones in a variety of normal tissues was found to be low or undetectable, with the exception of P544S (SEQ ID NO: 356) which was found to be expressed in small intestine. Of the 26 clones, 10 (SEQ ID NO: 340-349) were found to show some homology to previously identified sequences. No significant homologies were found to the clones of SEQ ID NO: 350-365.

EXAMPLE 6

PEPTIDE PRIMING OF MICE AND PROPAGATION OF CTL LINES

6.1. This Example illustrates the preparation of a CTL cell line specific for cells expressing the P502S gene.

Mice expressing the transgene for human HLA A2.1 (provided by Dr L. Sherman, The Scripps Research Institute, La Jolla, CA) were immunized with P2S#12 peptide (VLGWVAEL; SEQ ID NO: 306), which is derived from the P502S gene (also referred to herein as J1-17, SEQ ID NO: 8), as described by Theobald et al., *Proc. Natl. Acad. Sci. USA* 92:11993-11997, 1995 with the following modifications. Mice were immunized with 100µg of P2S#12 and 120µg of an I-A^b binding peptide derived from hepatitis B Virus protein emulsified in incomplete Freund's adjuvant. Three weeks later these mice were sacrificed and using a nylon mesh single cell suspensions prepared. Cells were then resuspended at 6×10^6 cells/ml in complete media (RPMI-1640; Gibco BRL, Gaithersburg, MD) containing 10% FCS, 2mM Glutamine (Gibco BRL), sodium pyruvate (Gibco BRL), non-essential amino acids (Gibco BRL), 2×10^{-5} M 2-mercaptoethanol, 50U/ml penicillin and streptomycin, and cultured in the presence of irradiated (3000 rads) P2S#12-pulsed (5mg/ml P2S#12 and 10mg/ml β 2-microglobulin) LPS blasts (A2 transgenic spleens cells cultured in the presence of 7µg/ml dextran sulfate and 25µg/ml LPS for 3 days). Six days later, cells (5×10^5 /ml) were restimulated with 2.5×10^6 /ml peptide pulsed irradiated (20,000 rads) EL4A2Kb cells (Sherman et al, *Science* 258:815-818, 1992) and 3×10^6 /ml A2 transgenic spleen feeder cells. Cells were cultured in the presence of 20U/ml IL-2. Cells continued to be restimulated on a weekly basis as described, in preparation for cloning the line.

P2S#12 line was cloned by limiting dilution analysis with peptide pulsed EL4 A2Kb tumor cells (1×10^4 cells/ well) as stimulators and A2 transgenic spleen cells as feeders (5×10^5 cells/ well) grown in the presence of 30U/ml IL-2. On day 14, cells were

restimulated as before. On day 21, clones that were growing were isolated and maintained in culture. Several of these clones demonstrated significantly higher reactivity (lysis) against human fibroblasts (HLA A2.1 expressing) transduced with P502S than against control fibroblasts. An example is presented in Figure 1.

This data indicates that P2S #12 represents a naturally processed epitope of the P502S protein that is expressed in the context of the human HLA A2.1 molecule.

6.2. This Example illustrates the preparation of murine CTL lines and CTL clones specific for cells expressing the P501S gene.

This series of experiments were performed similarly to that described above. Mice were immunized with the P1S#10 peptide (SEQ ID NO: 337), which is derived from the P501S gene (also referred to herein as L1-12, SEQ ID NO: 110). The P1S#10 peptide was derived by analysis of the predicted polypeptide sequence for P501S for potential HLA-A2 binding sequences as defined by published HLA-A2 binding motifs (Parker, KC, *et al*, *J. Immunol.*, 152:163, 1994). P1S#10 peptide was synthesized as described in Example 4, and empirically tested for HLA-A2 binding using a T cell based competition assay. Predicted A2 binding peptides were tested for their ability to compete HLA-A2 specific peptide presentation to an HLA-A2 restricted CTL clone (D150M58), which is specific for the HLA-A2 binding influenza matrix peptide fluM58. D150M58 CTL secretes TNF in response to self-presentation of peptide fluM58. In the competition assay, test peptides at 100-200 $\mu\text{g/ml}$ were added to cultures of D150M58 CTL in order to bind HLA-A2 on the CTL. After thirty minutes, CTL cultured with test peptides, or control peptides, were tested for their antigen dose response to the fluM58 peptide in a standard TNF bioassay. As shown in Figure 3, peptide P1S#10 competes HLA-A2 restricted presentation of fluM58, demonstrating that peptide P1S#10 binds HLA-A2.

Mice expressing the transgene for human HLA A2.1 were immunized as described by Theobald et al. (*Proc. Natl. Acad. Sci. USA* 92:11993-11997, 1995) with the following modifications. Mice were immunized with 62.5 μg of P1S #10 and 120 μg of an I-A^b binding peptide derived from Hepatitis B Virus protein emulsified in incomplete Freund's adjuvant. Three weeks later these mice were sacrificed and single cell suspensions prepared using a nylon mesh. Cells were then resuspended at 6×10^6 cells/ml in complete media (as described above) and cultured in the presence of irradiated (3000 rads) P1S#10-pulsed (2 $\mu\text{g/ml}$ P1S#10 and 10mg/ml β 2-microglobulin) LPS blasts (A2 transgenic spleens cells cultured in the presence of 7 $\mu\text{g/ml}$ dextran sulfate and 25 $\mu\text{g/ml}$ LPS for 3 days). Six days later cells (5×10^5 /ml) were restimulated with 2.5×10^6 /ml peptide-pulsed irradiated (20,000 rads) EL4A2Kb cells, as described above, and 3×10^6 /ml A2 transgenic spleen feeder cells. Cells were cultured in the presence of 20 U/ml IL-2. Cells were restimulated on a weekly

basis in preparation for cloning. After three rounds of *in vitro* stimulations, one line was generated that recognized P1S#10-pulsed Jurkat A2Kb targets and P501S-transduced Jurkat targets as shown in Figure 4.

A P1S#10-specific CTL line was cloned by limiting dilution analysis with peptide pulsed EL4 A2Kb tumor cells (1×10^4 cells/ well) as stimulators and A2 transgenic spleen cells as feeders (5×10^5 cells/ well) grown in the presence of 30U/ml IL-2. On day 14, cells were restimulated as before. On day 21, viable clones were isolated and maintained in culture. As shown in Figure 5, five of these clones demonstrated specific cytolytic reactivity against P501S-transduced Jurkat A2Kb targets. This data indicates that P1S#10 represents a naturally processed epitope of the P501S protein that is expressed in the context of the human HLA-A2.1 molecule.

EXAMPLE 7

ABILITY OF HUMAN T CELLS TO RECOGNIZE PROSTATE TUMOR POLYPEPTIDES

This Example illustrates the ability of T cells specific for a prostate tumor polypeptide to recognize human tumor.

Human CD8⁺ T cells were primed *in vitro* to the P2S-12 peptide (SEQ ID NO: 306) derived from P502S (also referred to as J1-17) using dendritic cells according to the protocol of Van Tsai et al. (*Critical Reviews in Immunology* 18:65-75, 1998). The resulting CD8⁺ T cell microcultures were tested for their ability to recognize the P2S-12 peptide presented by autologous fibroblasts or fibroblasts which were transduced to express the P502S gene in a γ -interferon ELISPOT assay (*see* Lalvani et al., *J. Exp. Med.* 186:859-865, 1997). Briefly, titrating numbers of T cells were assayed in duplicate on 10^4 fibroblasts in the presence of 3 μ g/ml human β_2 -microglobulin and 1 μ g/ml P2S-12 peptide or control E75 peptide. In addition, T cells were simultaneously assayed on autologous fibroblasts transduced with the P502S gene or as a control, fibroblasts transduced with HER-2/*neu*. Prior to the assay, the fibroblasts were treated with 10 ng/ml γ -interferon for 48 hours to upregulate class I MHC expression. One of the microcultures (#5) demonstrated strong recognition of both peptide pulsed fibroblasts as well as transduced fibroblasts in a γ -interferon ELISPOT assay. Figure 2A demonstrates that there was a strong increase in the number of γ -interferon spots with increasing numbers of T cells on fibroblasts pulsed with the P2S-12 peptide (solid bars) but not with the control E75 peptide (open bars). This shows the ability of these T cells to specifically recognize the P2S-12 peptide. As shown in Figure 2B, this microculture also demonstrated an increase in the number of γ -interferon spots with increasing numbers of T

cells on fibroblasts transduced to express the P502S gene but not the HER-2/*neu* gene. These results provide additional confirmatory evidence that the P2S-12 peptide is a naturally processed epitope of the P502S protein. Furthermore, this also demonstrates that there exists in the human T cell repertoire, high affinity T cells which are capable of recognizing this epitope. These T cells should also be capable of recognizing human tumors which express the P502S gene.

EXAMPLE 8

PRIMING OF CTL *IN VIVO* USING NAKED DNA IMMUNIZATION WITH A PROSTATE ANTIGEN

The prostate tumor antigen L1-12, as described above, is also referred to as P501S. HLA A2Kb Tg mice (provided by Dr L. Sherman, The Scripps Research Institute, La Jolla, CA) were immunized with 100 µg VR10132-P501S either intramuscularly or intradermally. The mice were immunized three times, with a two week interval between immunizations. Two weeks after the last immunization, immune spleen cells were cultured with Jurkat A2Kb-P501S transduced stimulator cells. CTL lines were stimulated weekly. After two weeks of *in vitro* stimulation, CTL activity was assessed against P501S transduced targets. Two out of 8 mice developed strong anti-P501S CTL responses. These results demonstrate that P501S contains at least one naturally processed A2-restricted CTL epitope.

EXAMPLE 9

GENERATION OF HUMAN CTL *IN VITRO* USING WHOLE GENE PRIMING AND STIMULATION TECHNIQUES WITH PROSTATE TUMOR ANTIGEN

Using *in vitro* whole-gene priming with P501S-retrovirally transduced autologous fibroblasts (see, for example, Yee et al, *The Journal of Immunology*, 157(9):4079-86, 1996), human CTL lines were derived that specifically recognize autologous fibroblasts transduced with P501S (also known as L1-12), as determined by interferon-γ ELISPOT analysis as described above. Using a panel of HLA-mismatched fibroblast lines transduced with P501S, these CTL lines were shown to be restricted HLA-A2 class I allele. Specifically, dendritic cells (DC) were differentiated from monocyte cultures derived from PBMC of normal human donors by growing for five days in RPMI medium containing 10% human serum, 50 ng/ml human GM-CSF and 30 ng/ml human IL-4. Following culture, DC were infected overnight with recombinant P501S vaccinia virus at a multiplicity of infection (M.O.I) of five, and matured overnight by the addition of 3 µg/ml CD40 ligand. Virus was inactivated by UV irradiation. CD8+ T cells were isolated using a magnetic bead system, and

priming cultures were initiated using standard culture techniques. Cultures were restimulated every 7-10 days using autologous primary fibroblasts retrovirally transduced with P501S. Following four stimulation cycles, CD8+ T cell lines were identified that specifically produced interferon- γ when stimulated with P501S-transduced autologous fibroblasts. The P501S-specific activity could be sustained by the continued stimulation of the cultures with P501S-transduced fibroblasts in the presence of IL-15. A panel of HLA-mismatched fibroblast lines transduced with P501S were generated to define the restriction allele of the response. By measuring interferon- γ in an ELISPOT assay, the P501S specific response was shown to be restricted by HLA-A2. These results demonstrate that a CD8+ CTL response to P501S can be elicited.

EXAMPLE 10

IDENTIFICATION OF A NATURALLY PROCESSED CTL EPITOPE CONTAINED WITHIN A PROSTATE TUMOR ANTIGEN

The 9-mer peptide p5 (SEQ ID NO: 338) was derived from the P703P antigen (also referred to as P20). The p5 peptide is immunogenic in human HLA-A2 donors and is a naturally processed epitope. Antigen specific CD8+ T cells can be primed following repeated *in vitro* stimulations with monocytes pulsed with p5 peptide. These CTL specifically recognize p5-pulsed target cells in both ELISPOT (as described above) and chromium release assays. Additionally, immunization of HLA-A2 transgenic mice with p5 leads to the generation of CTL lines which recognize a variety of P703P transduced target cells expressing either HLA-A2Kb or HLA-A2. Specifically, HLA-A2 transgenic mice were immunized subcutaneously in the footpad with 100 μ g of p5 peptide together with 140 μ g of hepatitis B virus core peptide (a Th peptide) in Freund's incomplete adjuvant. Three weeks post immunization, spleen cells from immunized mice were stimulated *in vitro* with peptide-pulsed LPS blasts. CTL activity was assessed by chromium release assay five days after primary *in vitro* stimulation. Retrovirally transduced cells expressing the control antigen P703P and HLA-A2Kb were used as targets. CTL lines that specifically recognized both p5-pulsed targets as well as P703P-expressing targets were identified.

Human *in vitro* priming experiments demonstrated that the p5 peptide is immunogenic in humans. Dendritic cells (DC) were differentiated from monocyte cultures derived from PBMC of normal human donors by culturing for five days in RPMI medium containing 10% human serum, 50 ng/ml human GM-CSF and 30 ng/ml human IL-4. Following culture, the DC were pulsed with p5 peptide and cultured with GM-CSF and IL-4 together with CD8+ T cell enriched PBMC. CTL lines were restimulated on a weekly basis

with p5-pulsed monocytes. Five to six weeks after initiation of the CTL cultures, CTL recognition of p5-pulsed target cells was demonstrated.

EXAMPLE 11

EXPRESSION OF A BREAST TUMOR-DERIVED ANTIGEN IN PROSTATE

Isolation of the antigen B305D from breast tumor by differential display is described in US Patent Application No. 08/700,014, filed August 20, 1996. Several different splice forms of this antigen were isolated. The determined cDNA sequences for these splice forms are provided in SEQ ID NO: 366-375, with the predicted amino acid sequences corresponding to the sequences of SEQ ID NO: 292, 298 and 301-303 being provided in SEQ ID NO: 299-306, respectively.

The expression levels of B305D in a variety of tumor and normal tissues were examined by real time PCR and by Northern analysis. The results indicated that B305D is highly expressed in breast tumor, prostate tumor, normal prostate tumor and normal testes, with expression being low or undetectable in all other tissues examined (colon tumor, lung tumor, ovary tumor, and normal bone marrow, colon, kidney, liver, lung, ovary, skin, small intestine, stomach).

EXAMPLE 12

ELICITATION OF PROSTATE TUMOR ANTIGEN-SPECIFIC CTL RESPONSES IN HUMAN BLOOD

This Example illustrates the ability of a prostate tumor antigen to elicit a CTL response in blood of normal humans.

Autologous dendritic cells (DC) were differentiated from monocyte cultures derived from PBMC of normal donors by growth for five days in RPMI medium containing 10% human serum, 50 ng/ml GMCSF and 30 ng/ml IL-4. Following culture, DC were infected overnight with recombinant P501S-expressing vaccinia virus at an M.O.I. of 5 and matured for 8 hours by the addition of 2 micrograms/ml CD40 ligand. Virus was inactivated by UV irradiation, CD8⁺ cells were isolated by positive selection using magnetic beads, and priming cultures were initiated in 24-well plates. Following five stimulation cycles, CD8⁺ lines were identified that specifically produced interferon-gamma when stimulated with autologous P501S-transduced fibroblasts. The P501S-specific activity of cell line 3A-1 could be maintained following additional stimulation cycles on autologous B-LCL transduced with P501S. Line 3A-1 was shown to specifically recognize autologous B-LCL transduced to

express P501S, but not EGFP-transduced autologous B-LCL, as measured by cytotoxicity assays (^{51}Cr release) and interferon-gamma production (Interferon-gamma Elispot; *see above* and Lalvani et al., *J. Exp. Med.* 186:859-865, 1997). The results of these assays are presented in Figures 6A and 6B.

EXAMPLE 13

IDENTIFICATION OF PROSTATE TUMOR ANTIGENS BY MICROARRAY ANALYSIS

This Example describes the isolation of certain prostate tumor polypeptides from a prostate tumor cDNA library.

A human prostate tumor cDNA expression library as described above was screened using microarray analysis to identify clones that display at least a three fold over-expression in prostate tumor and/or normal prostate tissue, as compared to non-prostate normal tissues (not including testis). 372 clones were identified, and 319 were successfully sequenced. Table I presents a summary of these clones, which are shown in SEQ ID NOs:385-400. Of these sequences SEQ ID NOs:386, 389, 390 and 392 correspond to novel genes, and SEQ ID NOs: 393 and 396 correspond to previously identified sequences. The others (SEQ ID NOs:385, 387, 388, 391, 394, 395 and 397-400) correspond to known sequences, as shown in Table I.

Table I
Summary of Prostate Tumor Antigens

| Known Genes | Previously identified Genes | Novel Genes |
|--|--|-----------------------|
| T-cell gamma chain | P504S | 23379 (SEQ ID NO:389) |
| Kallikrein | P1000C | 23399 (SEQ ID NO:392) |
| Vector | P501S | 23320 (SEQ ID NO:386) |
| CGI-82 protein mRNA (23319; SEQ ID NO:385) | P503S | 23381 (SEQ ID NO:390) |
| PSA | P510S | |
| Ald. 6 Dehyd. | P784P | |
| L-iditol-2 dehydrogenase (23376; SEQ ID NO:388) | P502S | |
| Ets transcription factor PDEF (22672; SEQ ID NO:398) | P706P | |
| hTGR (22678; SEQ ID NO:399) | 19142.2, bangur.seq (22621; SEQ ID NO:396) | |
| KIAA0295(22685; SEQ ID NO:400) | 5566.1 Wang(23404; SEQ ID NO:393) | |
| Prostatic Acid Phosphatase(22655; SEQ ID NO:397) | P712P | |

| | | |
|---|-------|--|
| transglutaminase (22611; SEQ ID NO:395) | P778P | |
| HDLBP (23508; SEQ ID NO:394) | | |
| CGI-69 Protein(23367; SEQ ID NO:387) | | |
| KIAA0122(23383; SEQ ID NO:391) | | |
| TEEG | | |

CGI-82 showed 4.06 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 43% of prostate tumors, 25% normal prostate, not detected in other normal tissues tested. L-iditol-2 dehydrogenase showed 4.94 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 90% of prostate tumors, 100% of normal prostate, and not detected in other normal tissues tested. Ets transcription factor PDEF showed 5.55 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 47% prostate tumors, 25% normal prostate and not detected in other normal tissues tested. hTGR1 showed 9.11 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 63% of prostate tumors and is not detected in normal tissues tested including normal prostate. KIAA0295 showed 5.59 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 47% of prostate tumors, low to undetectable in normal tissues tested including normal prostate tissues. Prostatic acid phosphatase showed 9.14 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 67% of prostate tumors, 50% of normal prostate, and not detected in other normal tissues tested. Transglutaminase showed 14.84 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 30% of prostate tumors, 50% of normal prostate, and is not detected in other normal tissues tested. High density lipoprotein binding protein (HDLBP) showed 28.06 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 97% of prostate tumors, 75% of normal prostate, and is undetectable in all other normal tissues tested. CGI-69 showed 3.56 fold over-expression in prostate tissues as compared to other normal tissues tested. It is a low abundant gene, detected in more than 90% of prostate tumors, and in 75% normal prostate tissues. The expression of this gene in normal tissues was very low. KIAA0122 showed 4.24 fold over-expression in prostate

tissues as compared to other normal tissues tested. It was over-expressed in 57% of prostate tumors, it was undetectable in all normal tissues tested including normal prostate tissues. 19142.2 bangur showed 23.25 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 97% of prostate tumors and 100% of normal prostate. It was undetectable in other normal tissues tested. 5566.1 Wang showed 3.31 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 97% of prostate tumors, 75% normal prostate and was also over-expressed in normal bone marrow, pancreas, and activated PBMC. Novel clone 23379 showed 4.86 fold over-expression in prostate tissues as compared to other normal tissues tested. It was detectable in 97% of prostate tumors and 75% normal prostate and is undetectable in all other normal tissues tested. Novel clone 23399 showed 4.09 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 27% of prostate tumors and was undetectable in all normal tissues tested including normal prostate tissues. Novel clone 23320 showed 3.15 fold over-expression in prostate tissues as compared to other normal tissues tested. It was detectable in all prostate tumors and 50% of normal prostate tissues. It was also expressed in normal colon and trachea. Other normal tissues do not express this gene at high level.

EXAMPLE 14

IDENTIFICATION OF PROSTATE TUMOR ANTIGENS BY ELECTRONIC SUBTRACTION

This Example describes the use of an electronic subtraction technique to identify prostate tumor antigens.

Potential prostate-specific genes present in the GenBank human EST database were identified by electronic subtraction (similar to that described by Vasmatizis et al., *Proc. Natl. Acad. Sci. USA* 95:300-304, 1998). The sequences of EST clones (43,482) derived from various prostate libraries were obtained from the GenBank public human EST database. Each prostate EST sequence was used as a query sequence in a BLASTN (National Center for Biotechnology Information) search against the human EST database. All matches considered identical (length of matching sequence >100 base pairs, density of identical matches over this region > 70%) were grouped (aligned) together in a cluster. Clusters containing more than 200 ESTs were discarded since they probably represented repetitive elements or highly expressed genes such as those for ribosomal proteins. If two or more clusters shared common ESTs, those clusters were grouped together into a "supercluster," resulting in 4,345 prostate superclusters.

Records for the 479 human cDNA libraries represented in the GenBank release were downloaded to create a database of these cDNA library records. These 479 cDNA libraries were grouped into three groups, Plus (normal prostate and prostate tumor libraries, and breast cell lines, in which expression was desired), Minus (libraries from other normal adult tissues, in which expression was not desirable), and Other (fetal tissue, infant tissue, tissues found only in women, non-prostate tumors and cell lines other than prostate cell lines, in which expression was considered to be irrelevant). A summary of these library groups is presented in Table II.

Table II
Prostate cDNA Libraries and ESTs

| Library | # of Libraries | # of ESTs |
|------------|----------------|-----------|
| Plus | 25 | 43,482 |
| Normal | 11 | 18,875 |
| Tumor | 11 | 21,769 |
| Cell lines | 3 | 2,838 |
| Minus | 166 | |
| Other | 287 | |

Each supercluster was analyzed in terms of the ESTs within the supercluster. The tissue source of each EST clone was noted and used to classify the superclusters into four groups: Type 1- EST clones found in the Plus group libraries only; no expression detected in Minus or Other group libraries; Type 2- EST clones found in the Plus and Other group libraries only; no expression detected in the Minus group; Type 3- EST clones found in the Plus, Minus and Other group libraries, but the expression in the Plus group is higher than in either the Minus or Other groups; and Type 4- EST clones found in Plus, Minus and Other group libraries, but the expression in the Plus group is higher than the expression in the Minus group. This analysis identified 4,345 breast clusters (*see* Table III). From these clusters, 3,172 EST clones were ordered from Research Genetics, Inc., and were received as frozen glycerol stocks in 96-well plates.

Table III
Prostate Cluster Summary

| Type | # of Superclusters | # of ESTs Ordered |
|-------|-----------------------|----------------------|
| 1 | 688 | 677 |
| 2 | 2899 | 2484 |
| 3 | 85 | 11 |
| 4 | 673 | 0 |
| Total | 4345 | 3172 |

The inserts were PCR-amplified using amino-linked PCR primers for Synteni microarray analysis. When more than one PCR product was obtained for a particular clone, that PCR product was not used for expression analysis. In total, 2,528 clones from the electronic subtraction method were analyzed by microarray analysis to identify electronic subtraction breast clones that had high tumor vs. normal tissue mRNA. Such screens were performed using a Synteni (Palo Alto, CA) microarray, according to the manufacturer's instructions (and essentially as described by Schena et al., *Proc. Natl. Acad. Sci. USA* 93:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA* 94:2150-2155, 1997). Within these analyses, the clones were arrayed on the chip, which was then probed with fluorescent probes generated from normal and tumor prostate cDNA, as well as various other normal tissues. The slides were scanned and the fluorescence intensity was measured.

Clones with an expression ratio greater than 3 (*i.e.*, the level in prostate tumor cDNA was at least three times the level in normal prostate cDNA) were identified as prostate tumor-specific sequences (Table IV). The sequences of these clones are provided in SEQ ID NOs:401-453, with certain novel sequences shown in SEQ ID NOs:407, 413, 416-419, 422, 426, 427 and 450.

Table IV
Prostate-tumor Specific Clones

| SEQ ID NO. | Sequence Designation | Comments |
|------------|-------------------------|------------------------------|
| 401 | 22545 | previously identified P1000C |
| 402 | 22547 | previously identified P704P |

| | | |
|-----|-------|--------------------------------|
| 403 | 22548 | known |
| 404 | 22550 | known |
| 405 | 22551 | PSA |
| 406 | 22552 | prostate secretory protein 94 |
| 407 | 22553 | novel |
| 408 | 22558 | previously identified P509S |
| 409 | 22562 | glandular kallikrein |
| 410 | 22565 | previously identified P1000C |
| 411 | 22567 | PAP |
| 412 | 22568 | B1006C (breast tumor antigen) |
| 413 | 22570 | novel |
| 414 | 22571 | PSA |
| 415 | 22572 | previously identified P706P |
| 416 | 22573 | novel |
| 417 | 22574 | novel |
| 418 | 22575 | novel |
| 419 | 22580 | novel |
| 420 | 22581 | PAP |
| 421 | 22582 | prostatic secretory protein 94 |
| 422 | 22583 | novel |
| 423 | 22584 | prostatic secretory protein 94 |
| 424 | 22585 | prostatic secretory protein 94 |
| 425 | 22586 | known |
| 426 | 22587 | novel |
| 427 | 22588 | novel |
| 428 | 22589 | PAP |
| 429 | 22590 | known |
| 430 | 22591 | PSA |
| 431 | 22592 | known |
| 432 | 22593 | Previously identified P777P |
| 433 | 22594 | T cell receptor gamma chain |
| 434 | 22595 | Previously identified P705P |
| 435 | 22596 | Previously identified P707P |
| 436 | 22847 | PAP |
| 437 | 22848 | known |
| 438 | 22849 | prostatic secretory protein 57 |

| | | |
|-----|-------|------------------------------|
| 439 | 22851 | PAP |
| 440 | 22852 | PAP |
| 441 | 22853 | PAP |
| 442 | 22854 | previously identified P509S |
| 443 | 22855 | previously identified P705P |
| 444 | 22856 | previously identified P774P |
| 445 | 22857 | PSA |
| 446 | 23601 | previously identified P777P |
| 447 | 23602 | PSA |
| 448 | 23605 | PSA |
| 449 | 23606 | PSA |
| 450 | 23612 | novel |
| 451 | 23614 | PSA |
| 452 | 23618 | previously identified P1000C |
| 453 | 23622 | previously identified P705P |

EXAMPLE 15

FURTHER IDENTIFICATION OF PROSTATE TUMOR ANTIGENS BY MICROARRAY ANALYSIS

This Example describes the isolation of additional prostate tumor polypeptides from a prostate tumor cDNA library.

A human prostate tumor cDNA expression library as described above was screened using microarray analysis to identify clones that display at least a three fold over-expression in prostate tumor and/or normal prostate tissue, as compared to non-prostate normal tissues (not including testis). 142 clones were identified and sequenced. Certain of these clones are shown in SEQ ID NOs:454-467. Of these sequences SEQ ID NOs:459-461 correspond to novel genes. The others (SEQ ID NOs:454-458 and 461-467) correspond to known sequences.

EXAMPLE 16

FURTHER CHARACTERIZATION OF PROSTATE TUMOR ANTIGEN P710P

This Example describes the full length cloning of P710P.

The prostate cDNA library described above was screened with the P710P fragment described above. One million colonies were plated on LB/Ampicillin plates. Nylon membrane filters were used to lift these colonies, and the cDNAs picked up by these filters were then denatured and cross-linked to the filters by UV light. The P710P fragment was radiolabeled and used to hybridize with the filters. Positive cDNA clones were selected and their cDNAs recovered and sequenced by an automatic ABI Sequencer. Four sequences were obtained, and are presented in SEQ ID NOs:468-471.

From the foregoing, it will be appreciated that, although specific embodiments of the invention have been described herein for the purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the present invention is not limited except as by the appended claims.

CLAIMS

1. An isolated polypeptide comprising at least an immunogenic portion of a prostate tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in any one of SEQ ID NOs: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471 or 472;

(b) sequences that hybridize to any of the foregoing sequences under moderately stringent conditions; and

(c) complements of any of the sequence of (a) or (b).

2. An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471 or 472, or a complement of any of the foregoing polynucleotide sequences.

3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NO: 108, 112, 113, 114, 172, 176, 178, 327, 329, 331, 339 and 383.

4. An isolated polynucleotide encoding at least 15 amino acid residues of a prostate tumor protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NOs: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434,

435, 442-444, 446, 450, 452, 453, 459-461, 468-471 or 472, or a complement of any of the foregoing sequences.

5. An isolated polynucleotide encoding a prostate tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NOs:2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471 or 472, or a complement of any of the foregoing sequences.

6. An isolated polynucleotide comprising a sequence recited in any one of SEQ ID NOs:2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471 or 472.

7. An isolated polynucleotide comprising a sequence that hybridizes, under moderately stringent conditions, to a sequence recited in any one of SEQ ID NOs:2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471 or 472.

8. An isolated polynucleotide complementary to a polynucleotide according to any one of claims 4-7.

9. An expression vector comprising a polynucleotide according to any one of claims 4-7.

10. A host cell transformed or transfected with an expression vector according to claim 9.

11. An expression vector comprising a polynucleotide according claim 8.

12. A host cell transformed or transfected with an expression vector according to claim 11.

13. A pharmaceutical composition comprising a polypeptide according to claim 1, in combination with a physiologically acceptable carrier.

14. A vaccine comprising a polypeptide according to claim 1, in combination with a non-specific immune response enhancer.

15. A vaccine according to claim 14, wherein the non-specific immune response enhancer is an adjuvant.

16. A vaccine according to claim 14, wherein the non-specific immune response enhancer induces a predominantly Type I response.

17. A pharmaceutical composition comprising a polynucleotide according to claim 4, in combination with a physiologically acceptable carrier.

18. A vaccine comprising a polynucleotide according to claim 4, in combination with a non-specific immune response enhancer.

19. A vaccine according to claim 18, wherein the non-specific immune response enhancer is an adjuvant.

20. A vaccine according to claim 18, wherein the non-specific immune response enhancer induces a predominantly Type I response.

21. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a prostate tumor protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs:2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471 or 472 or a complement of any of the foregoing polynucleotide sequences.

22. A pharmaceutical composition comprising an antibody or fragment thereof according to claim 18, in combination with a physiologically acceptable carrier.

23. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a pharmaceutically acceptable carrier or excipient.

24. A pharmaceutical composition according to claim 23, wherein the antigen presenting cell is a dendritic cell or a macrophage.

25. A vaccine comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a non-specific immune response enhancer.

26. A vaccine according to claim 25, wherein the non-specific immune response enhancer is an adjuvant.

27. A vaccine according to claim 25, wherein the non-specific immune response enhancer induces a predominantly Type I response.

28. A vaccine according to claim 25, wherein the antigen-presenting cell is a dendritic cell.

29. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a polypeptide according to claim 1, and thereby inhibiting the development of a cancer in the patient.

30. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a polynucleotide according to claim 4, and thereby inhibiting the development of a cancer in the patient.

31. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antibody or antigen-binding fragment thereof according to claim 21, and thereby inhibiting the development of a cancer in the patient.

32. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide according to claim 1, and thereby inhibiting the development of a cancer in the patient.

33. A method according to claim 32, wherein the antigen-presenting cell is a dendritic cell.

34. A method according to any one of claims 29-32, wherein the cancer is prostate cancer.

35. A fusion protein comprising at least one polypeptide according to claim 1.

36. A fusion protein according to claim 35, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.

37. A fusion protein according to claim 35, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.

38. A fusion protein according to claim 35, wherein the fusion protein comprises an affinity tag.

39. An isolated polynucleotide encoding a fusion protein according to claim 35.

40. A pharmaceutical composition comprising a fusion protein according to claim 32, in combination with a physiologically acceptable carrier.

41. A vaccine comprising a fusion protein according to claim 35, in combination with a non-specific immune response enhancer.

42. A vaccine according to claim 41, wherein the non-specific immune response enhancer is an adjuvant.

43. A vaccine according to claim 41, wherein the non-specific immune response enhancer induces a predominantly Type I response.

44. A pharmaceutical composition comprising a polynucleotide according to claim 40, in combination with a physiologically acceptable carrier.

45. A vaccine comprising a polynucleotide according to claim 40, in combination with a non-specific immune response enhancer.

46. A vaccine according to claim 45, wherein the non-specific immune response enhancer is an adjuvant.

47. A vaccine according to claim 45, wherein the non-specific immune response enhancer induces a predominantly Type I response.

48. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 40 or claim 44.

49. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a vaccine according to claim 41 or claim 45.

50. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a prostate tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 or 384-472; and

(ii) complements of the foregoing polynucleotides;
wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the prostate tumor protein from the sample.

51. A method according to claim 50, wherein the biological sample is blood or a fraction thereof.

52. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated according to the method of claim 50.

53. A method for stimulating and/or expanding T cells specific for a prostate tumor protein, comprising contacting T cells with one or more of:

- (i) a polypeptide according to claim 1;
 - (ii) a polypeptide encoded by a polynucleotide comprising a sequence provided in any one of SEQ ID NOs:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 or 384-472;
 - (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and/or
 - (iv) an antigen presenting cell that expresses a polypeptide of (i) or (ii);
- under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

54. An isolated T cell population, comprising T cells prepared according to the method of claim 53.

55. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 54.

56. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NOs:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 or 384-472;
- (iii) a polynucleotide encoding a polypeptide of (i) or (ii); or
- (iv) an antigen-presenting cell that expresses a polypeptide of (i) or (ii);

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.

57. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NOs: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 or 384-472;
- (iii) a polynucleotide encoding a polypeptide of (i) or (ii); or
- (iv) an antigen-presenting cell that expresses a polypeptide of (i) or (ii);

such that T cells proliferate;

- (b) cloning at least one proliferated cell; and
- (c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.

58. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with a binding agent that binds to a prostate tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 or 384-472; and

(ii) complements of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent; and

(c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

59. A method according to claim 58, wherein the binding agent is an antibody.

60. A method according to claim 59, wherein the antibody is a monoclonal antibody.

61. A method according to claim 58, wherein the cancer is prostate cancer.
62. A method for monitoring the progression of a cancer in a patient, comprising the steps of:
- (a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a prostate tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 or 384-472, or a complement of any of the foregoing polynucleotides;
 - (b) detecting in the sample an amount of polypeptide that binds to the binding agent;
 - (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and
 - (d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.
63. A method according to claim 62, wherein the binding agent is an antibody.
64. A method according to claim 63, wherein the antibody is a monoclonal antibody.
65. A method according to claim 62, wherein the cancer is a prostate cancer.
66. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:
- (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a prostate tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 or 384-472, or a complement of any of the foregoing polynucleotides;
 - (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; and

(c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

67. A method according to claim 66, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

68. A method according to claim 66, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

69. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a prostate tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 or 384-472, or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;

(c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

70. A method according to claim 69, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

71. A method according to claim 69, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

72. A diagnostic kit, comprising:

(a) one or more antibodies according to claim 21; and

(b) a detection reagent comprising a reporter group.

73. A kit according to claim 72, wherein the antibodies are immobilized on a solid support.

74. A kit according to claim 73, wherein the solid support comprises nitrocellulose, latex or a plastic material.

75. A kit according to claim 72, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.

76. A kit according to claim 72, wherein the reporter group is selected from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.

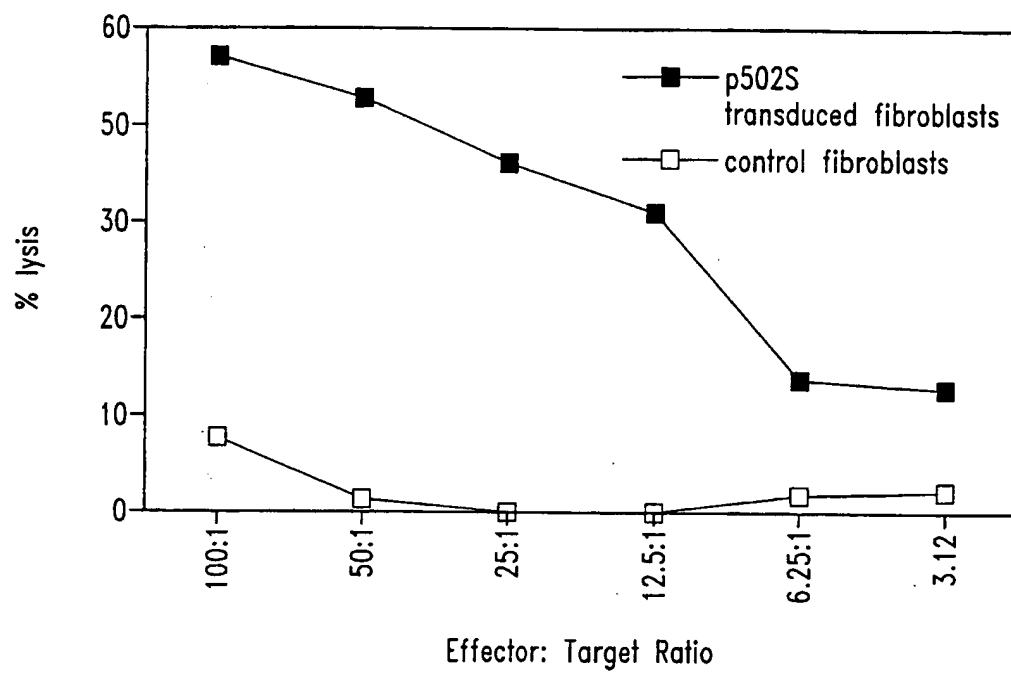
77. An oligonucleotide comprising 10 to 40 nucleotides that hybridize under moderately stringent conditions to a polynucleotide that encodes a prostate tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs:2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471 or 472, or a complement of any of the foregoing polynucleotides.

78. A oligonucleotide according to claim 77, wherein the oligonucleotide comprises 10-40 nucleotides recited in any one of SEQ ID NOs:2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471 or 472.

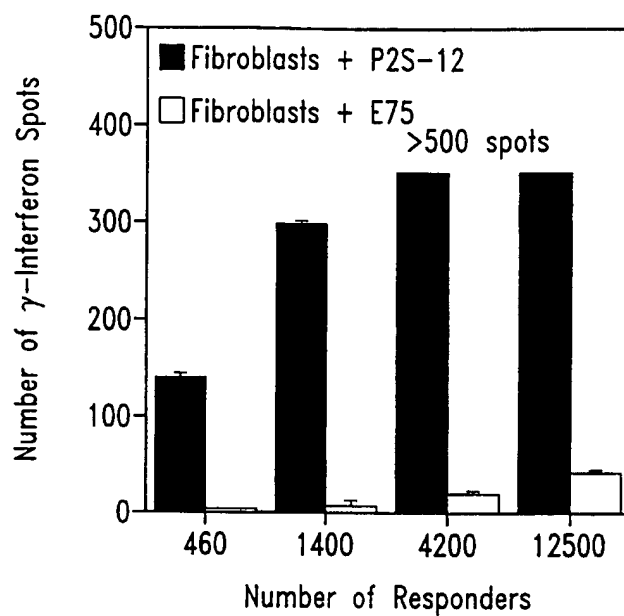
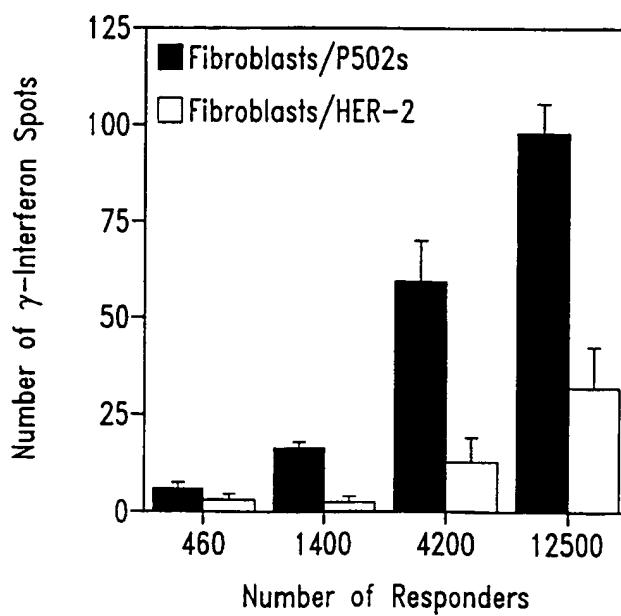
79. A diagnostic kit, comprising:

- (a) an oligonucleotide according to claim 77; and
- (b) a diagnostic reagent for use in a polymerase chain reaction or hybridization assay.

1/5

*Fig. 1*

2/5

*Fig. 2A**Fig. 2B*

3/5

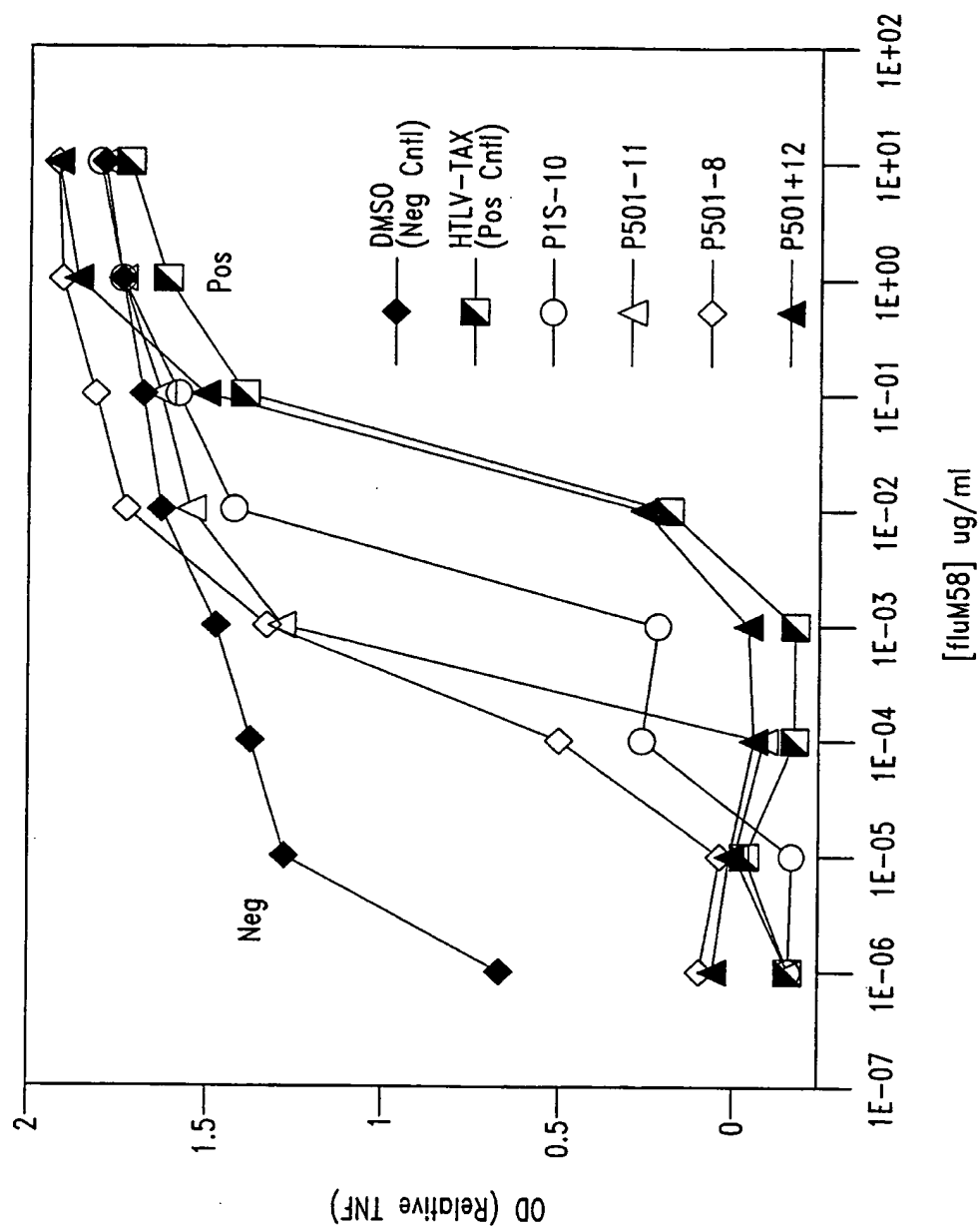
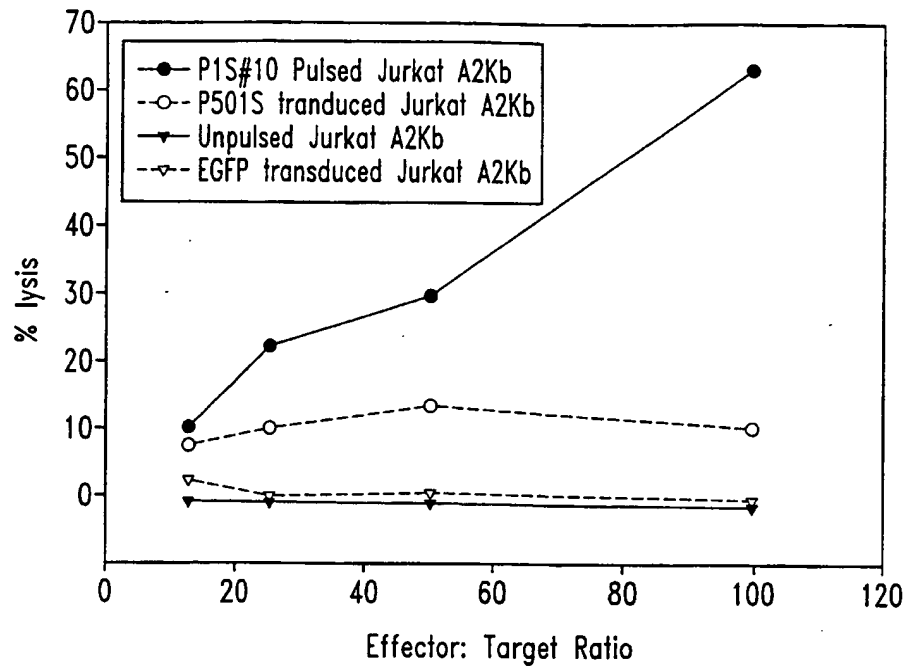
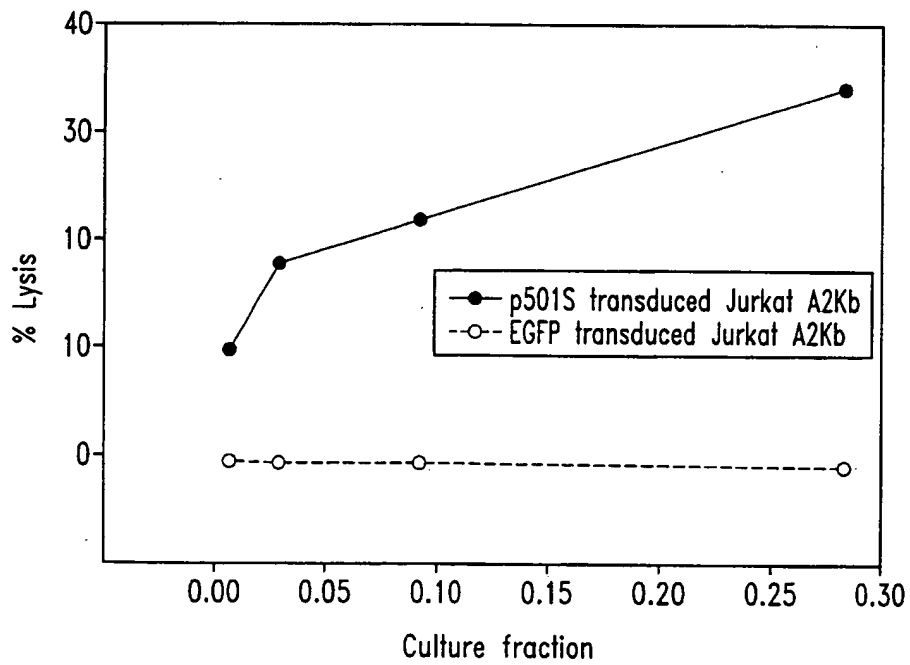
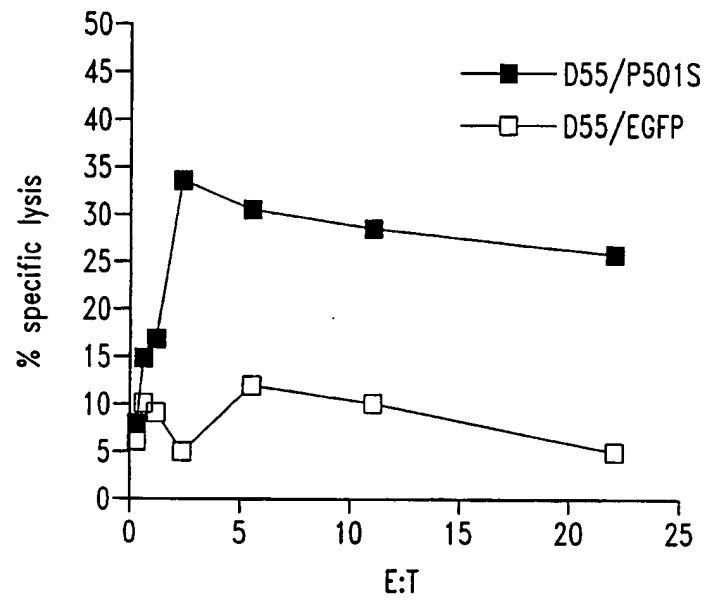
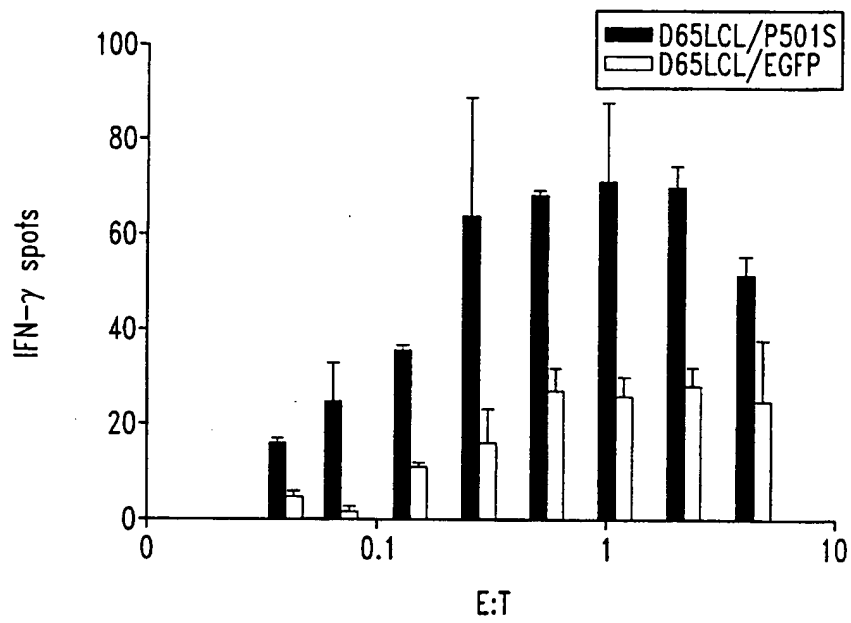


Fig. 3

4/5

*Fig. 4**Fig. 5*

5/5

*Fig. 6**Fig. 7*

SEQUENCE LISTING

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<120> COMPOUNDS FOR IMMUNOTHERAPY AND DIAGNOSIS
OF PROSTATE CANCER AND METHODS FOR THEIR USE

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<140> PCT

<141> 1999-07-08

<160> 472

<170> FastSEQ for Windows Version 3.0

<210> 1

<211> 814

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(814)

<223> n = A,T,C or G

<400> 1

| | | | | | | |
|-------------|------------|------------|-------------|-------------|-------------|-----|
| tttttttttt | tttttcacag | tataacagct | ctttatttct | gtgagttcta | ctaggaaatc | 60 |
| atcaaatctg | agggttgtct | ggaggacttc | aatacacctc | cccccatagt | gaatcagctt | 120 |
| ccaggggggc | cagtcctctc | ccttacttca | tccccatccc | atgccaaagg | aagaccctcc | 180 |
| ctccttggct | cacagccttc | tctaggcttc | ccagtgcctc | caggacagag | tgggttatgt | 240 |
| tttcagctcc | atccttgctg | tgagtgtctg | gtgcgttggtg | cctccagctt | ctgctcagtg | 300 |
| cttcattggac | agtgtccagc | acatgtcact | ctccactctc | tcagtgtgga | tccactagtt | 360 |
| ctagagcggc | cgccaccgcg | gtggagctcc | agcttttgtt | cccttttagtg | agggttaatt | 420 |
| gcgcgcttgg | cgtaatcatg | gtcataactg | tttcctgtgt | gaaattgtta | tccgctcaca | 480 |
| attccacaca | acatacgagc | cggaagcata | aagtgtaaag | cctgggggtgc | ctaattgagtg | 540 |
| anctaactca | cattaattgc | gttgcgctca | ctgnccgctt | tccagtcnng | aaaactgtcg | 600 |
| tgccagctgc | attaatgaat | cggccaacgc | ncggggaaaa | gcggtttgcg | ttttgggggc | 660 |
| tcttccgctt | ctcgctcact | nantcctgcg | ctcggtcntt | cggctgcggg | gaacggtatc | 720 |
| actcctcaaa | ggnggtatta | cggttatccn | naaatcnngg | gatacccnng | aaaaaanttt | 780 |
| aacaaaaggg | cancaaaggg | cngaaacgta | aaaa | | | 814 |

<210> 2

<211> 816

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(816)

<223> n = A,T,C or G

<400> 2

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| acagaaatgt | tggatggtgg | agcacctttc | tatacgactt | acaggacagc | agatggggaa | 60 |
| ttcatggctg | ttggagcaat | agaacccccag | ttctacgagc | tgctgatcaa | aggacttggg | 120 |

```

ctaaagtctg atgaacttcc caatcagatg agcatggatg attggccaga aatgaagaag      180
aagtttgcag atgtatttgc aaagaagacg aaggcagagt ggtgtcaa atttgacggc      240
acagatgcct gtgtgactcc ggttctgact tttgaggagg ttgttcatca tgatcacaac      300
aaggaacggg gctcgtttat caccagttag gagcaggacg tgagcccccg ccctgcacct      360
ctgctgttaa acaccccagc catcccttct ttcaaaaggg atccactagt tctagaagcg      420
gccgccaccg cgggtggagct ccagcttttg ttccctttag tgagggttaa ttgcgcgctt      480
ggcgtaatac tgggtcatagc tgtttcctgt gtgaaattgt tatccgctca caattccccc      540
aacatacgag ccggaacata aagtgttaag cctgggggtgc ctaatgantg agctaactcn      600
cattaattgc gttgcgctca ctgcccgtt tccagtcggg aaaactgtcg tgccactgcn      660
ttantgaatc ngccaccccc cgggaaaagg cggttgcntt ttgggcctct tccgctttcc      720
tcgctcattg atcctngcnc ccggtcttcg gctgcgngga acggttcact cctcaaaggc      780
ggtntnccgg ttatcccaa acnnggggata cccnga                                816

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<210> 3

<211> 773

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (773)

<223> n = A,T,C or G

<400> 3

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cttttgaaaag aagggtatggc tgggggtgttt aacagcagag gtgcagggcg ggggctcacg      60
tcctgtctcct cactgggtgat aaacgagccc cgcttccttgt tgtgatcatg atgaacaacc      120
tcctcaaaag tcagaaccgg agtcacacag gcatctgtgc cgtcaaagat ttgacaccac      180
tctgccttcg tcttctttgc aaatacatct gcaaacttct tcttcatttc tggccaatca      240
tccatgctca tctgattggg aagttcacat gacttttagtc canntccttt gatcagcagc      300
tcgtagaact ggggttctat tgctccaaca gccatgaatt ccccatctgc tgtcctgtaa      360
gtcgtataga aagggtgctcc accatccaac atgttctgtc ctgcaggggg ggcccggtac      420
ccaattcgcc ctatantgag tcgtattacg cgcgctcact ggccgtcggt ttacaacgct      480
gtgactggga aaaccctggg cgttaccaac ttaatcgctc tgcagcacat ccccttttcg      540
ccagctgggc gtaatanca aaaggcccgc accgatcgcc ctccaacag ttgcgcacct      600
gaatgggnaa atgggacccc cctgttacg cgcattnaac ccccgnggg tttngttgtt      660
acccccacnt nnaccgctta cactttgccg gcgccttanc gcccgctccc tttcnccttt      720
cttcccttcc tttcncncn ctttcccccg ggggtttcccc cntcaaacc cna                                773

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<210> 4

<211> 828

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (828)

<223> n = A,T,C or G

<400> 4

```

cctcctgagt cctactgacc tgtgctttct ggtgtggagt ccagggtgc taggaaaagg      60
aatgggcaga cacaggtgta tgccaatgtt tctgaaatgg gtataatttc gtcctctcct      120
tcggaacact ggctgtctct gaagacttct cgctcagttt cagtgaggac acacacaaag      180
acgtgggtga ccatgttgtt tgtgggggtgc agagatggga ggggtggggc ccaccctgga      240
agagtggaca gtgacacaag gtggacactc tctacagatc actgaggata agctggagcc      300
acaatgcatt aggcacacac acagcaagga tgacnctgta aacatagccc acgctgtcct      360

```

```

gnngggcactg ggaagcctan atnaggccgt gagcanaaag aaggggagga tccactagtt      420
ctanagcggc cgccaccgcg gtgganctcc ancttttgtt cccttttagtg aggggttaatt      480
gcgcgcttgg cntaatcatg gtcatanctn tttcctgtgt gaaattgtta tccgctcaca      540
attccacaca acatacganc cggaaacata aantgtaaac ctgggggtgcc taatgantga      600
ctaactcaca ttaattgcgt tgcgctcact gcccgctttc caatcnggaa acctgtcttg      660
ccncttgcat tnatgaatcn gccaaccccc ggggaaaagc gtttgcgttt tgggcgctct      720
tccgcttcct cnetcantta ntccctncnc tcggtcattc cggctgcngc aaaccggttc      780
accnctcca aagggggtat tccggtttcc ccnaatccgg gganancc      828

```

<210> 5

<211> 834

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(834)

<223> n = A,T,C or G

<400> 5

```

tttttttttt tttttactga tagatggaat ttattaagct tttcacatgt gatagcacat      60
agttttaatt gcatccaaag tactaacaaa aactctagca atcaagaatg gcagcatgtt      120
attttataac aatcaacacc tgtggctttt aaaatttggt tttcataaga taatttatac      180
tgaagtaaat ctagccatgc ttttaaaaaa tgcttttaggt cactccaagc ttggcagtta      240
acatttgcca taaacaataa taaaacaatc acaatttaat aaataacaaa tacaacattg      300
taggccataa tcatatacag tataaggaaa aggtggtagt gttgagtaag cagttattag      360
aatagaatac cttggcctct atgcaaatat gtctagacac tttgattcac tcagccctga      420
cattcagttt tcaaagtagg agacaggttc tacagtatca ttttacagtt tccaacacat      480
tgaaaacaag tagaaaatga tgagttgatt tttattaatg cattacatcc tcaagagtta      540
tcaccaaccc ctgagttata aaaaattttc aagttatatt agtcatataa cttgggtgtgc      600
ttatttttaa ttagtgctaa atggattaag tgaagacaac aatgggtcccc taatgtgatt      660
gatattggtc atttttacca gcttctaaat ctnaactttc aggcttttga actggaacat      720
tgnatnacag tgttccanag ttncaaccta ctggaacatt acagtgtgct tgattcaaaa      780
tgttattttg ttaaaaatta aattttaacc tgggtgaaaa ataatttgaa atna      834

```

<210> 6

<211> 818

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(818)

<223> n = A,T,C or G

<400> 6

```

tttttttttt tttttttttt aagaccctca tcaatagatg gagacataca gaaatagtca      60
aaccacatct acaaaaatgcc agtatcaggc ggcggcttcg aagccaaagt gatgtttgga      120
tgtaaagtga aatattagtt ggcggatgaa gcagatagtg aggaaagttag agccaataat      180
gacgtgaagt ccgtggaagc ctgtggctac aaaaaatgtt gagccgtaga tgccgtcgga      240
aatggtgaag ggagactcga agtactctga ggcttgtagg agggtaaaat agagaccag      300
taaaattgta ataagcagtg cttgaattat ttggtttcgg ttgttttcta ttagactatg      360
gtgagctcag gtgattgata ctctgatgc gagtaatacg gatgtgttta ggagtgggac      420
ttctagggga tttagcgggg tgatgcctgt tgggggccag tgccctccta gttggggggt      480
aggggctagg ctggagtggg aaaaaggctca gaaaaatcct gcgaagaaaa aaacttctga      540

```

| | | | | | | |
|------------|------------|------------|-------------|-------------|------------|-----|
| ggtaataaat | aggattatcc | cgtatcgaag | gccttttttg | acagggtggtg | tgtggtggcc | 600 |
| ttggtatgtg | ctttctcgtg | ttacatcgcg | ccatcattgg | tatatgggta | gtgtgttggg | 660 |
| ttantanggc | ctantatgaa | gaactttttg | antggaatta | aatcaatngc | ttggccggaa | 720 |
| gtcattanga | nggctnaaaa | ggccctgtta | nggggtctggg | ctnggtttta | cccnacccat | 780 |
| ggaatncncc | ccccggacna | ntgnatccct | attcttaa | | | 818 |

<210> 7

<211> 817

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(817)

<223> n = A,T,C or G

<400> 7

| | | | | | | |
|-------------|-------------|------------|-------------|-------------|-------------|-----|
| tttttttttt | tttttttttt | tggctctaga | gggggtagag | ggggtgctat | agggtaaata | 60 |
| cggggccctat | ttcaaagatt | tttaggggaa | ttaattctag | gacgatgggt | atgaaactgt | 120 |
| ggtttgctcc | acagatttca | gagcattgac | cgtagtatac | ccccggtcgt | gtagcggtgga | 180 |
| aagtggtttg | gttttagacgt | ccgggaattg | catctgtttt | taagcctaata | gtggggacag | 240 |
| ctcatgagtg | caagacgtct | tgtgatgtaa | ttattatacn | aatgggggct | tcaatcggga | 300 |
| gtactactcg | attgtcaacg | tcaaggagtc | gcaggtcgcc | tggttctagg | aataatgggg | 360 |
| gaagtatgta | ggaattgaag | attaatccgc | cgtagtcggg | gttctcctag | gttcaataacc | 420 |
| attgggtggcc | aattgatttg | atggtaaggg | gagggatcgt | tgaactcgtc | tgttatgtaa | 480 |
| aggatncctt | ngggatggga | aggcnatnaa | ggactangga | tnaatggcgg | gcangatatt | 540 |
| tcaaacngtc | tctanttcct | gaaacgtctg | aaatgttaat | aanaattaan | tttngttatt | 600 |
| gaatnttnng | gaaaagggct | tacaggacta | gaaaccaaata | angaaaanta | atnntaangg | 660 |
| cnttatctntn | aaaggtnata | accnctccta | tnatcccacc | caatngnatt | ccccacncnn | 720 |
| acnattggat | nccccanttc | canaaanggc | cnccccccg | tgnannccnc | cttttggtcc | 780 |
| cttnantgan | ggttattcnc | ccctngcntt | atcance | | | 817 |

<210> 8

<211> 799

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(799)

<223> n = A,T,C or G

<400> 8

| | | | | | | |
|------------|------------|------------|-------------|------------|-------------|-----|
| catttccggg | tttactttct | aaggaaagcc | gagcgggaagc | tgctaacgtg | ggaatcgggtg | 60 |
| cataaggaga | actttctgct | ggcacgcgct | agggacaagc | gggagagcga | ctccgagcgt | 120 |
| ctgaagcgca | cgtcccagaa | ggtggacttg | gcactgaaac | agctgggaca | catccgcgag | 180 |
| tacgaacagc | gcctgaaagt | gctggagcgg | gaggtccagc | agtgtagccg | cgtcctgggg | 240 |
| tgggtggccg | angcctganc | cgctctgect | tgctgcccc | angtgggccc | ccacccctg | 300 |
| acctgcctgg | gtccaaacac | tgagccctgc | tggcggactt | caagganaac | ccccacangg | 360 |
| ggattttgct | cctanantaa | ggctcatctg | ggcctcggcc | ccccacctg | gttggccttg | 420 |
| tctttgagnt | gagcccatg | tccatctggg | ccactgtcng | gaccaccttt | ngggagtgtt | 480 |
| ctccttacaa | ccacannatg | cccggctcct | cccggaaacc | antcccance | tgngaaggat | 540 |
| caagnccctn | atccactnnt | nctanaaccg | gccnccnccg | cngtggaaac | cnccttntgt | 600 |
| tccttttctt | tnagggttaa | tnnccgcttg | gccttnccan | ngtcctncnc | nttttccnnt | 660 |
| gttnaaattg | ttangcnccc | nccnntcccn | cnnccnnan | cccgaaccnn | annttnnann | 720 |

ncctgggggt nccnncgat tgaccnnc nccctntant tgcnttnggg nncnntgccc 780
ctttccctct nggganncg 799

<210> 9
<211> 801
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(801)
<223> n = A,T,C or G

<400> 9
acgccttgat cctcccaggc tgggactggt tctgggagga gccgggcatg ctgtgggttg 60
taangatgac actcccaaag gtggtcctga cagtggccca gatggacatg gggctcacct 120
caaggacaag gccaccaggt gcgggggccc aagcccatat gatccttact ctatgagcaa 180
aatccctgt gggggcttct ccttgaagtc cgccancagg gctcagtctt tggaccang 240
caggtcatgg ggtgtngnc caactggggg ccncaacgca aaanggcna gggcctcngn 300
caccatccc angacgcggc tacactnctg gacctccnc tccaccactt tcatgcgctg 360
ttcntacccg cgnatntgtc ccantgttt cngtgcenac tccantctt nggacgtgcg 420
ctacatacgc cgggancnc nctcccgtt tgtccctatc cagtnccan caacaaattt 480
cncntantg caccnatcc cacttttnc agntttcnc nncngcttc cttntaaaag 540
ggttgancgc cggaaaatnc cccaaagggg gggggccngg taccnaactn cccctnata 600
gctgaantcc ccatnaccnn gntcnaatg anccntcct ttaannacn tctnaactt 660
gggaanance ctcgncntn ccccnctaa tccnccctg cnangnncnt ccccnntcc 720
nccnntng gcntntnann cnaaaaaggc ccnnancaa tctcctnnn cctcanttcg 780
ccanccctg aaatcgccn c 801

<210> 10
<211> 789
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(789)
<223> n = A,T,C or G

<400> 10
cagtctatnt ggccagtgtg gcagctttcc ctgtggctgc cggtgccaca tgctgtccc 60
acagtgtggc cgtggtgaca gcttcagccg ccctcaccgg gttcaccttc tcagccctgc 120
agatcctgcc ctacacactg gcctccctct accaccggga gaagcaggtg ttctgccc 180
aataccgagg ggacactgga ggtgctagca gtgaggacag cctgatgacc agcttcctgc 240
caggccctaa gcctggagct ccctcccta atggacacgt ggggtgctgga ggcagtggcc 300
tgctcccacc tccaccgcg ctctgcgggg cctctgcctg tgatgtctcc gtacgtgtgg 360
tggtgggtga gccaccgan gccagggtgg ttccgggccc gggcatctgc ctggacctcg 420
ccatcctgga tagtgcttcc tgctgtccca ngtggcccca tccctgttta tgggtccat 480
tgtccagctc agccagtctg tactgccta tatggtgtct gccgcaggcc tgggtctggt 540
cccatttact ttgctacaca ggtantattt gacaagaacg anttgccaa atactcagcg 600
ttaaaaaatt ccagcaacat tgggggtgga aggcctgcct cactgggtcc aactccccgc 660
tcctgttaac ccatggggc tgccggcttg gccccaatt tctgttctg ccaaanatnat 720
gtggtctctc gctgccacct gttgctggct gaagtgcnta cngcncanct nggggggtng 780
ggngttccc 789

<210> 11
 <211> 772
 <212> DNA
 <213> Homo sapien

 <220>
 <221> misc_feature
 <222> (1)...(772)
 <223> n = A,T,C or G

<400> 11
 cccaccctac ccaaataatta gacaccaaca cagaaaagct agcaatggat tcccttctac 60
 tttgttaaat aaataagtta aatattttaa tgcctgtgtc tctgtgatgg caacagaagg 120
 accaacaggc cacatcctga taaaaggtaa gaggggggtg gatcagcaaa aagacagtgc 180
 tgtgggctga ggggacctgg ttcttgtgtg ttgcccctca ggactcttcc cctacaaata 240
 actttcatat gttcaaatec catggaggag tgtttcatcc tagaaactcc catgcaagag 300
 ctacattaaa cgaagctgca ggttaagggg cttanagatg ggaaaccagg tgactgagtt 360
 tattcagctc ccaaaaaccc ttctctaggt gtgtctcaac taggaggcta gctgttaacc 420
 ctgagcctgg gtaatccacc tgcagagtcc ccgcattcca gtgcatggaa cccttctggc 480
 ctccctgtat aagtccagac tgaaaccccc ttggaaggnc tccagtcagg cagccctana 540
 aactggggaa aaaagaaaag gacgccccan cccccagctg tgcantacg cacctcaaca 600
 gcacagggtg gcagcaaaaa aaccacttta ctttggcaca aacaaaaact ngggggggca 660
 accccggcac ccnangggg gttaacagga ancnnggnaa cntggaaccc aattnaggca 720
 gggccnccac ccnaatntt gctgggaaat ttttctccc ctaaattntt tc 772

<210> 12
 <211> 751
 <212> DNA
 <213> Homo sapien

 <220>
 <221> misc_feature
 <222> (1)...(751)
 <223> n = A,T,C or G

<400> 12
 gcccgaattc cagctgccac accaccacag gtgactgcat tagttcggat gtcatacaaa 60
 agctgattga agcaaccctc tacttttttg tctgtgagct tttgcttggg gcagggtttca 120
 ttggctgtgt tggtagctgt gtcattgcaa cagaatgggg gaaaggcact gttctctttg 180
 aagtanggtg agtcctcaaa atccgtatag ttgggtgaagc cacagcactt gagccctttc 240
 atggtgggtg tccacacttg agtgaagtct tccctgggaac cataatcttt cttgatggca 300
 ggcactacca gcaacgtcag ggaagtgtc agccattgtg gtgtacacca aggcgaccac 360
 agcagctgcn acctcagcaa tgaagatgan gaggangatg aagaagaacg tcncgagggc 420
 acacttgctc tcagtcttan caccatanca gccntgaaa accaananca aagaccacna 480
 cnccggctgc gatgaagaaa tnacccncg ttgacaaact tgcattggcag tggganccac 540
 agtggccena aaaatcttca aaaaggatgc cccatcnatt gacccccaa atgcccactg 600
 ccaacagggg gtgccccacn cncnnaacga tgancnatt gnacaagatc tncntggctc 660
 tnatnaacnt gaacccctgcn tngtggctcc tgttcaggnc cnnggcctga cttctnaann 720
 aangaactcn gaagncacca cngganannc g 751

<210> 13
 <211> 729
 <212> DNA
 <213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(729)

<223> n = A,T,C or G

<400> 13

| | | | | | | |
|------------|------------|------------|------------|------------|-------------|-----|
| gagccaggcg | tcctctgcc | tgccactca | gtggcaacac | ccgggagctg | ttttgtcctt | 60 |
| tgtggancct | cagcagtncc | ctctttcaga | actcantgcc | aaganccctg | aacaggagcc | 120 |
| accatgcagt | gcttcagctt | cattaagacc | atgatgatec | tcttcaattt | gtcatctttt | 180 |
| ctgtgtggtg | cagccctggt | ggcagtgggc | atctgggtgt | caatcgatgg | ggcatccttt | 240 |
| ctgaagatct | tcgggccact | gtcgtccagt | gccatgcagt | ttgtcaacgt | gggctacttc | 300 |
| ctcatcgcag | ccggcggtgt | ggtcttagct | ctaggtttcc | tgggctgcta | tgggtgctaag | 360 |
| actgagagca | agtgtgccct | cgtgacgttc | ttcttcaccc | tcctcctcat | cttcattgct | 420 |
| gaggttgcaa | tgctgtggtc | gccttggtgt | acaccacaat | ggctgagcac | ttcctgacgt | 480 |
| tgctggtaat | gcctgccatc | aanaaaagat | tatgggttcc | caggaanact | tcactcaagt | 540 |
| gttggaacac | caccatgaaa | gggctcaagt | gctgtggctt | cnnccaacta | tacggatttt | 600 |
| gaagantcac | ctacttcaaa | gaaaanagtg | cctttccccc | atttctgttg | caattgacaa | 660 |
| acgtccccaa | cacagccaat | tgaaaacctg | cacccaaccc | aaanggggtc | ccaaccanaa | 720 |
| attnaaggg | | | | | | 729 |

<210> 14

<211> 816

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(816)

<223> n = A,T,C or G

<400> 14

| | | | | | | |
|------------|------------|------------|------------|-------------|-------------|-----|
| tgctcttctt | caaagttggt | cttggtgcca | taacaaccac | cataggtaaa | gcgggagcag | 60 |
| tgttcgctga | aggggttgta | gtaccagcgc | gggatgctct | ccttgcagag | tcctgtgtct | 120 |
| ggcaggtcca | cgcagtggcc | tttgtcactg | gggaaatgga | tgcgctggag | ctcgtcaaag | 180 |
| ccactcgtgt | atttttcaca | ggcagcctcg | tccgacgcgt | cggggcagtt | gggggtgtct | 240 |
| tcacactcca | ggaaactgtc | natgcagcag | ccattgctgc | agcggaactg | ggtgggctga | 300 |
| cangtgccag | agcacactgg | atggcgcttt | tccatgnnan | gggcccctgng | ggaaagtccc | 360 |
| tganccccan | anctgcctct | caaangcccc | accttgcaca | ccccgacagg | ctagaatgga | 420 |
| atcttcttcc | cgaaaggtag | ttnttcttgt | tgcccaancc | anccccntaa | acaaactctt | 480 |
| gcanatctgc | tccngggggg | tcntantacc | ancgtgggaa | aagaacccca | ggcngcgaac | 540 |
| caancttggt | tggatnccga | gcnataatct | nctnttctgc | ttggtggaca | gcaccantna | 600 |
| ctgtnnanct | ttagnccntg | gtcctcntgg | gttgnncttg | aacctaatcn | ccnntcaact | 660 |
| gggacaaggt | aantngccnt | cctttnaatt | cccnanctn | ccccctgggt | tgggggttttn | 720 |
| cncnctcta | ccccagaaan | nccgtgttcc | cccccaacta | ggggccnaaa | ccnntnttcc | 780 |
| cacaacctn | ccccaccac | gggttcngnt | ggttng | | | 816 |

<210> 15

<211> 783

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(783)

<223> n = A,T,C or G

<400> 15

| | | | | | | |
|------------|------------|------------|------------|-------------|-------------|-----|
| ccaaggcctg | ggcaggcata | nacttgaagg | tacaacccca | ggaacccctg | gtgctgaagg | 60 |
| atgtggaaaa | cacagattgg | cgctactgc | ggggtgacac | ggatgtcagg | gtagagagga | 120 |
| aagacccaaa | ccaggtggaa | ctgtggggac | tcaaggaang | cacctacctg | ttccagctga | 180 |
| cagtgactag | ctcagaccac | ccagaggaca | cggccaacgt | cacagtcaact | gtgctgtcca | 240 |
| ccaagcagac | agaagactac | tgcctcgcat | ccaacaangt | gggtcgctgc | cggggctctt | 300 |
| tcccacgctg | gtactatgac | cccacggagc | agatctgcaa | gagtttcgtt | tatggaggct | 360 |
| gcttgggcaa | caagaacaac | taccttcggg | aagaagagt | cattctancc | tgtcnggggtg | 420 |
| tgcaagggtg | gcctttgana | ngcanctctg | gggtcangc | gactttcccc | cagggccccc | 480 |
| ccatggaaag | gcgccatcca | ntgttctctg | gcacctgtca | gcccacccag | ttccgctgca | 540 |
| ncaatggctg | ctgcacnac | antttcctng | aattgtgaca | acacccccca | ntgcccccaa | 600 |
| ccctcccaac | aaagcttccc | tgttnaaaaa | tacnccantt | ggcttttnac | aaacnccccg | 660 |
| cncctccttt | ttccccnntn | aacaaagggc | nctngcnttt | gaactgcccn | aacccnggaa | 720 |
| tctnccnngg | aaaaantncc | ccccctgggt | cctnnaancc | cctccncaaa | anctncccc | 780 |
| ccc | | | | | | 783 |

<210> 16

<211> 801

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(801)

<223> n = A,T,C or G

<400> 16

| | | | | | | |
|-------------|------------|------------|------------|------------|------------|-----|
| gccccaatc | cagctgccac | accaccacag | gtgactgcat | tagttcggat | gtcatacaaa | 60 |
| agctgattga | agcaaccctc | tacttttttg | tcgtgagcct | tttgcttggt | gcaggtttca | 120 |
| ttggctgtgt | tggtgacgtt | gtcattgcaa | cagaatgggg | gaaaggcact | gttctctttg | 180 |
| aagttaggtg | agtcctcaaa | atccgtatag | ttggtgaagc | cacagcactt | gagccctttc | 240 |
| atggtgggtg | tccacacttg | agtgaagtct | tcctgggaac | cataatcttt | cttgatggca | 300 |
| ggcactacca | gcaacgtcag | gaagtgtctc | gccattgtgg | tgtacaccaa | ggcgaccaca | 360 |
| gcagctgcaa | cctcagcaat | gaagatgagg | aggaggatga | agaagaacgt | cncgagggca | 420 |
| cacttgctct | ccgtcttagc | accatagcag | cccangaaac | caagagcaaa | gaccacaacg | 480 |
| ccngctgcga | atgaaaagaa | ntaccacagt | tgacaaactg | catggccact | ggacgacagt | 540 |
| tgcccgaan | atcttcagaa | aagggatgcc | ccatcgattg | aacacccana | tgcccactgc | 600 |
| cnacagggct | gcncncncn | gaaagaatga | gccattgaag | aaggatcnc | ntggtcttaa | 660 |
| tgaactgaaa | ccntgcatgg | tggccctgt | tcagggctct | tggcagtga | ttctganaaa | 720 |
| aaggaaacngc | ntnagcccc | ccaaangana | aaacaccccc | gggtgttgcc | ctgaattggc | 780 |
| ggccaaggan | ccctgccccn | g | | | | 801 |

<210> 17

<211> 740

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(740)

<223> n = A,T,C or G

<400> 17

| | | | | | | |
|------------|------------|----------|------------|-----------|------------|----|
| gtgagagcca | ggcgtccctc | tgctgcca | ctcagtggca | acaccggga | gctgttttgt | 60 |
|------------|------------|----------|------------|-----------|------------|----|

```

cctttgtgga gcctcagcag ttccctcttt cagaactcac tgccaagagc cctgaacagg 120
agccaccatg cagtgcctca gcttcattaa gaccatgatg atcctcttca atttgctcat 180
ctttctgtgt ggtgcagccc tgttggcagt gggcatctgg gtgtcaatcg atggggcatc 240
ctttctgaag atcttcgggc cactgtcgtc cagtgccatg cagtttgtca acgtgggcta 300
cttcctcatc gcagccggcg ttgtggtctt tgctcttggg ttccctgggct gctatgggta 360
taagacggag agcaagtgtg ccctcgtgac gttcttcttc atcctcctcc tcatcttcat 420
tgctgaagtt gcagctgctg tggcgcctt ggtgtacacc acaatggctg aaccattcct 480
gacgttgctg gtantgcctg ccatcaanaa agattatggg tcccaggaa aaattcactc 540
aantntggaa caccnccatg aaaagggtc caatttctgn tggcttcccc aactataccg 600
gaattttgaa agantcncct tacttccaaa aaaaaanant tgccttttnc cccnttctgt 660
tgcaatgaaa acntcccaan acngccaatn aaaacctgcc cnnncaaaaa ggntcncaaa 720
caaaaaaant nnaagggttn
740

```

<210> 18

<211> 802

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(802)

<223> n = A,T,C or G

<400> 18

```

ccgctgggtg cgctgggtcca gngnagccac gaagcacgtc agcatacaca gcctcaatca 60
caaggtcttc cagctgccgc acattacgca gggcaagagc ctccagcaac actgcatatg 120
ggatacactt tacttttagca gccagggtga caactgagag gtgtcgaagc ttattcttct 180
gagcctctgt tagtggagga agattccggg cttcagctaa gtagtcagcg tatgtcccat 240
aagcaaacac tgtgagcagc cggaaggtag aggcaaagtc actctcagcc agctctctaa 300
cattgggcat gtccagcagt tctccaaaca cgtagacacc agnggcctcc agcacctgat 360
ggatgagtggt ggccagcgct gcccccttgg ccgacttggc taggagcaga aattgctcct 420
ggttctgccc tgtcaccttc acttccgcac tcatcactgc actgagtgtg ggggacttgg 480
gctcaggatg tccagagacg tggttccgcc ccctcnctta atgacaccgn ccanncaacc 540
gtcggctccc gccgantgng ttcgtcgtnc ctgggtcagg gtctgtgtgc cnctacttgc 600
aancttctgc nggccccatg aattcaccnc accggaactn gtangatcca ctntttctat 660
aaccggnccg caccgcnnnt ggaactccac tcttnttnc tttacttgag ggtaagggtc 720
acccttnncc ttaccttggg ccaaaccntn cntgtgtcg anatngtnaa tcngnccna 780
tnccancnc atangaagcc ng
802

```

<210> 19

<211> 731

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(731)

<223> n = A,T,C or G

<400> 19

```

cnaagcttcc aggtnacggg ccgcnaancc tgaccnagg tancanaang cagnncggg 60
gagcccaccg tcacngngng gngtctttat nggagggggc ggagccacat cnetggacnt 120
cntgaccca actcccncc ncnantgca gtgatgagtg cagaactgaa ggtnacgtgg 180
caggaaccaa gancaaannc tgctccnntc caagtccgcn nagggggcgg ggctggccac 240
gcncatcent cnagtgtgn aaagcccn cctgtctact tgtttgaga acngcnnga 300

```

| | | | | | | |
|------------|------------|------------|------------|------------|-------------|-----|
| catgcccagn | ggtanataac | nggcngagag | tnantttgcc | tctcccttcc | ggctgcgcan | 360 |
| cgngtntgct | tagnggacat | aacctgacta | cttaactgaa | cccnngaate | tnccnccct | 420 |
| ccactaagct | cagaacaaaa | aacttcgaca | ccactcantt | gtcacctgnc | tgctcaagta | 480 |
| aagtgtaccc | catncccaat | gtntgctnga | ngctctgncc | tgcnttangt | tcggctcctgg | 540 |
| gaagacctat | caattnaagc | tatgtttctg | actgcctctt | gctccctgna | acaancnacc | 600 |
| cnnnntcca | agggggggnc | ggcccccaat | ccccccaacc | ntnaattnan | tttancccn | 660 |
| ccccnggcc | cggcctttta | cnancntcnn | nnacngggna | aaaccnnngc | tttncccaac | 720 |
| nnaatecncc | t | | | | | 731 |

<210> 20

<211> 754

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (754)

<223> n = A,T,C or G

<400> 20

| | | | | | | |
|-------------|------------|-------------|-------------|------------|------------|-----|
| tttttttttt | tttttttttt | taaaaacccc | ctccattnaa | tgnaaacttc | cgaaattgtc | 60 |
| caacccccctc | ntccaaatnn | ccntttccgg | gnggggggttc | caaacccaan | ttanntttgg | 120 |
| annttaaatt | aaatnttnt | tgngggnnna | anccnaatgt | nangaaagtt | naaccanta | 180 |
| tnancctnaa | tnccctgaaa | ccngtngntt | ccaaaaatnt | ttaaccctta | antccctccg | 240 |
| aaatngttna | nggaaaaccc | aantttctnt | aagggttggtt | gaaggntnaa | tnaaaaancc | 300 |
| nnccaattgt | ttttngccac | gcctgaatta | attggnntcc | gntgttttcc | nttaaaanaa | 360 |
| ggnnancccc | ggttantnaa | tccccccnnc | cccaattata | ccganttttt | ttngaattgg | 420 |
| gancccnccg | gaattaacgg | ggnnnnntccc | tnttgggggg | cnggnncccc | ccccntccgg | 480 |
| ggttngggnc | aggncnnaat | tgtttaaggg | tccgaaaaat | ccctccnaga | aaaaaanctc | 540 |
| ccaggntgag | nntnggggtt | nccccccccc | cangggccct | ctcgnaagtt | tgggggtttg | 600 |
| ggggcctggg | attttntttc | ccctnttncc | tccccccccc | ccnggganag | aggttngngt | 660 |
| tttgntcnn | ggccccnccn | aaganccttt | ccganttnan | ttaaatccnt | gcctnggcga | 720 |
| agtcnnttgn | agggntaaan | ggccccctnn | cggg | | | 754 |

<210> 21

<211> 755

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (755)

<223> n = A,T,C or G

<400> 21

| | | | | | | |
|------------|------------|------------|------------|------------|-------------|-----|
| atcancccat | gacccnaac | nngggaccnc | teanccggnc | nnncnaccnc | cgcccnatca | 60 |
| nngtnagnnc | actncnnttn | natacncccc | cncnactac | gcccncnanc | cnacgcnceta | 120 |
| nncanatncc | actganngcg | cgangtngan | ngagaaant | nataccanag | ncaccanacn | 180 |
| ccagctgtcc | nanaangcct | nnnatacnng | nnnatccaat | ntgnancctc | cnaagtattn | 240 |
| nncnncan | gattttcctn | anccgattac | ccntcccccc | tancccttcc | cccccaacna | 300 |
| cgaaggcnct | ggncnnaagg | nngcgnccnc | ccgctagntc | cccnnaagtt | cncncncceta | 360 |
| aactcancn | nattacncgc | ttcntgagta | teactccccg | aatctcaccc | tactcaactc | 420 |
| aaaaanacn | gatacaaat | aatncaagcc | tgnttatnac | actntgactg | ggtctctatt | 480 |
| ttagnggtcc | ntnaancntc | ctaatacttc | cagtcctncc | tcnccaattt | ccnaanggct | 540 |
| ctttcngaca | gcantttttg | gttcccnntt | gggttcttan | ngaattgccc | ttcntngaac | 600 |

| | | | | | | |
|-------------|-------------|------------|------------|------------|------------|-----|
| gggctctctct | tttcccttcgg | ttancctggn | ttcnnccggc | cagttattat | ttcccntttt | 660 |
| aaattctntc | cntttanttt | tggcnttcna | aacccccggc | cttgaaaacg | gccccctggt | 720 |
| aaaaggttgt | tttganaaaa | tttttgttt | gttcc | | | 755 |

<210> 22

<211> 849

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(849)

<223> n = A,T,C or G

<400> 22

| | | | | | | |
|------------|-------------|-------------|------------|------------|------------|-----|
| tttttttttt | tttttangtg | tngtcgtgca | ggtagaggct | tactacaant | gtgaanacgt | 60 |
| acgctnggan | taangcgacc | cgantttctag | ganncnccct | aaaatcanac | tgtgaagatn | 120 |
| atcctgnnna | cggaanggtc | accggnggat | nntgctaggg | tgncnctcc | cannncnttn | 180 |
| cataactcng | nggcccctgcc | caccaccttc | ggcggcccng | ngnccggggc | cgggtcattn | 240 |
| gnnttaaccn | cactnngcna | ncggtttccn | cccccnng | accnnggcga | tccggggtnc | 300 |
| tctgtcttcc | cctgnagncn | anaaantggg | ccncggnccc | ctttaccctt | nnacaagcca | 360 |
| cngcctctta | ncnengccc | ccctccant | nnnggggact | gccnannget | ccgttctnng | 420 |
| nnaccccnnn | gggtncctcg | gttgctcgant | cnaccgnang | ccanggatcc | cnaaggaagg | 480 |
| tgcgttnttg | gccccctacc | ttcgtctnccg | nnaccccttc | ccgacnanga | nccgctcccg | 540 |
| cnncnccgng | cctcncctcg | caacacccgc | netctctngt | ncggnnnccc | ccccacccgc | 600 |
| ncectcncnc | ngnccgnancn | ctccnccncc | gtctcannca | ccaccccgcc | ccgccaggcc | 660 |
| ntcanccacn | ggnggacnng | nagcncnttc | gcncgcgcgn | gcgncnccct | cgcncngaa | 720 |
| ctnctcngg | ccantnncgc | tcaanccnna | cnaaacgcgc | ctgcgcggcc | cgnagcgncc | 780 |
| ncctcncga | gtcctcccgn | cttcenaccc | angrnttccn | cgaggacacn | nnaccccgcc | 840 |
| nncangcgg | | | | | | 849 |

<210> 23

<211> 872

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(872)

<223> n = A,T,C or G

<400> 23

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| gcgcaaacta | tacttcgctc | gnactcgtgc | gcctcgtctc | tcttttcttc | cgcaaccatg | 60 |
| tctgacnanc | ccgattnggc | ngatatacnan | aagntcganc | agtccaaact | gantaacaca | 120 |
| cacacncnan | aganaaatcc | nctgccttcc | anagtanacn | attgaacnng | agaaccangc | 180 |
| nggggaatcg | taatnaggcg | tgccgcgcga | atntgtcncc | gtttattntn | ccagctcnc | 240 |
| ctnccnacc | tacntcttcn | nagctgtcnn | accctngtn | cgnaccccc | naggtcggga | 300 |
| tccgggtttn | nntgaccng | cnccccctcc | ccccctccat | nacganccnc | ccgcaccacc | 360 |
| nanngcncgc | nceccgnnet | cttcgccncc | ctgtcctntn | cccctgtngc | ctggcnengn | 420 |
| accgcattga | ccctcgccnn | ctnccnngaaa | ncgnanacgt | ccgggttggn | annancgctg | 480 |
| tgggnnngcg | tctgcncgc | gttccttccn | ncncttcca | ccatcttctt | tacngggctt | 540 |
| ccnccctc | tcnnncacnc | cctgggacgc | tnctctntgc | cccccttnac | tccccctt | 600 |
| cgnctgtgcc | cgnccccacc | ntcatttnca | nacgntcttc | acaannncc | ggnntnctcc | 660 |
| cnancngnnc | gtcanccnag | ggaagggngg | ggnnccnntg | nttgacgttg | ngngangtc | 720 |
| cgaanantcc | tcnccntcan | cncctaccct | cgggcgnnet | ctcngttnc | aacttancaa | 780 |

ntctcccccg ngngcnctc tcagcctenc ccccccnct ctctgcantg tntctctgctc 840
tnaccnntac gantnttcgn cncctctctt cc 872

<210> 24

<211> 815

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (815)

<223> n = A,T,C or G

<400> 24

| | | | | | | |
|-------------|------------|------------|------------|------------|------------|-----|
| gcatgcaagc | ttgagtattc | tatagngtca | cctaaatanc | ttggcntaat | catggtcnta | 60 |
| nctgncttcc | tgtgtcaa | gtatacna | tanatatgaa | tctnatntga | caaganngta | 120 |
| tentncatta | gtaacaantg | tnntgtccat | cctgtcngan | canattccca | tnnattnecn | 180 |
| cgcattcnen | gencantatn | taatngggaa | ntcnntnnn | ncaccnncat | ctatcntncc | 240 |
| gncacctgac | tggagagat | ggatnanttc | tnntntgacc | nacatgttca | tcttggattn | 300 |
| aanancccc | cgcngccac | cggttngnng | cnagccnntc | ccaagacctc | ctgtggaggt | 360 |
| aacctgcgtc | aganncatca | aacntgggaa | acccgcnncc | angtnnaagt | ngnnncanan | 420 |
| gatcccgctc | aggnttnacc | atcccttcnc | agcgccccct | ttngtgcctt | anagnnagc | 480 |
| gtgtccnanc | cnetcaacat | ganacgcgcc | agnccanccg | caattnggca | caatgtcgnc | 540 |
| gaaccccccta | gggggantna | tncaaanccc | caggattgtc | cncncangaa | atcccnanc | 600 |
| ccnccctac | ccncttttg | gacngtgacc | aantccccga | gtncagatcc | ggccngnctc | 660 |
| ccccaccgt | nncntgggg | gggtgaanct | cngnntcanc | cngncgaggn | ntcgnaagga | 720 |
| accggnccn | ggncgaanng | ancnntcnga | agngccnct | cgtataacce | cccctcncca | 780 |
| nccnacngnt | agntcccccc | cngggtncgg | aangg | | | 815 |

<210> 25

<211> 775

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (775)

<223> n = A,T,C or G

<400> 25

| | | | | | | |
|------------|------------|------------|------------|-------------|------------|-----|
| ccgagatgtc | tcgctccgtg | gccttagctg | tgetcgcgct | actctctctt | tctggcctgg | 60 |
| aggctatcca | gcgtactcca | aagattcagg | tttactcacg | tcattccagca | gagaatggaa | 120 |
| agtcaaattt | cctgaattgc | tatgtgtctg | ggtttcatcc | atccgacatt | gaanttgcct | 180 |
| tactgaagaa | tgganagaga | attgaaaaag | tggagcattc | agacttgtct | ttcagcaagg | 240 |
| actggtcttt | ctatctcttg | tactacactg | aattcacccc | cactgaaaaa | gatgagtatg | 300 |
| cctgccgtgt | gaaccatgtg | actttgtcac | agcccaagat | agttaagtgg | gatcgagaca | 360 |
| tgtaagcagn | cnnatggaa | gtttgaagat | gccgcatttg | gattggatga | attccaaatt | 420 |
| ctgcttgctt | gcntttta | antgatatgc | ntatacaccc | taccttttat | gnccccaaat | 480 |
| tgtaggggtt | acatnantgt | tcnctnngga | catgatcttc | ctttataant | ccnccnttcg | 540 |
| aattgccgt | nccccngtn | ngaattgttc | cnaaaccacg | gttggtctcc | ccaggtcncc | 600 |
| tcttacggaa | gggcctgggc | cnccttncaa | gggtggggga | accnaaaatt | tcncttntgc | 660 |
| ccnccncca | cnntcttgng | nncncanttt | ggaaccttc | cnattccct | tggcctcnna | 720 |
| nccttnncta | anaaaacttn | aaancgtngc | naaaantttt | acttcccccc | ttacc | 775 |

<210> 26

<211> 820
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(820)
 <223> n = A,T,C or G

<400> 26
 anattantac agtgtaatct ttccccagag gtgtgtanag ggaacggggc ctagaggcat 60
 cccanagata ncttatanca acagtgtctt gaccaagagc tgctgggcac atttcctgca 120
 gaaaagggtg cggtcccat cactcctcct ctcccatagc catcccagag gggtagtag 180
 ccatcangcc ttcggtggga gggagtcang gaaacaacan accacagagc anacagacca 240
 ntgatgacca tgggcgggag cgagcctctt ccctgnaccg gggtaggana nganagccta 300
 nctgaggggt cacactataa acgttaacga ccnagatnan cacctgcttc aagtgcaccc 360
 ttcctacctg acnaccagng accnnnaact gcngcctggg gacagcctg ggancagcta 420
 acnnagcact cacctgcccc cccatggcgg tncgcntccc tggctcctgnc aagggaagct 480
 ccctgttgga attncgggga naccaaggga nccccctcct ccancgtgtga aggaaaaann 540
 gatggaattt tncctctccg gccnntcccc tcttctctta cagccccct nntactctc 600
 tccctctntt ntcctgncnc acttttnacc ccnnnatctt ccttnattga tcggannctn 660
 ganattccac tnnccgctnc cntcnatcng naanacnaaa nactntctna ccnnggggat 720
 gggnnccctg ntcactctct ctttttctct accnccnntt ctttgctct ccttngatca
 780tccaacctc gntggcctn ccccccnntt tcttttnc
 820

<210> 27
 <211> 818
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(818)
 <223> n = A,T,C or G

<400> 27
 tctgggtgat ggcctcttcc tcctcagga cctctgactg ctctgggcca aagaatctct 60
 tgtttcttct ccgagcccca ggcagcggg attcagccct gcccaacctg attctgatga 120
 ctgaggatgc tgtgacggac ccaaggggca aataggggtc cagggtccag ggaggggagc 180
 ctgctgagca ctcccgcccc tcacctgcc cagccctgct catgagctct gggctgggtc 240
 tccgcctcca gggttctgct ctccangca ngccancaag tggcgctggg ccacactggc 300
 ttcttctgct cccntccctg gctctgante tctgtcttcc tgcctgtgc angcncctg 360
 gatctcagtt tccctcctc anngaactct gttctgann tcttcantta actntgantt 420
 tatnaccnan tggnetgtnc tgtcnnactt taatgggcn gaccggctaa tccctccctc 480
 nctcccttcc anttcnnna accngcttnc cntctctcc cntanccg ccngggaanc 540
 ctcttttgcc ctaccangg gccnnnaccg cccntnnctn ggggggcnng gtnnctnnc 600
 ctgntnnccc cncctcncnt tncctgctc cncnncgcn nngcannttc ncngtcccn 660
 tnnctcttcn ngntcgnaa ngntcncntn tnnnnngcn ngntnntcn tccctctcnc 720
 cnnntgnang tnnntnnnc ncngnncccc nnnnnnnnn nggnntnnn tctnncngc 780
 cccnncccc ngnattaagg cctccnntct ccggcnc 818

<210> 28
 <211> 731
 <212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(731)

<223> n = A,T,C or G

<400> 28

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| aggaaggcg | gagggatatt | gtangggatt | gagggatagg | agnataangg | gggaggtgtg | 60 |
| tcccaacatg | anggtgnngt | tctcttttga | angagggttg | ngtttttann | ccnggtgggt | 120 |
| gattnaaccc | cattgtatgg | agnnaaaggn | tttnagggat | ttttcggtc | ttatcagtat | 180 |
| ntanattcct | gtnaatcgga | aaatnatntt | tcnncnggaa | aatnttgctc | ccatccgnaa | 240 |
| attnctcccg | ggtagtgc | nttngggggn | cngccangtt | tcccaggctg | ctanaatcgt | 300 |
| actaaagnnt | naagtggan | tncaaataaa | aacctnnac | agagnatccn | tacccgactg | 360 |
| tnnnttnect | tcgccctntg | actctgcnn | agcccaatac | ccnngngnat | gtcncccn | 420 |
| nnngcgcnc | tgaaannnnc | tcngggctnn | gancatcang | gggtttcgca | tcaaaagcnn | 480 |
| cgtttcncat | naaggcactt | tngectcatc | caaccnctng | ccctcncca | tttngccgtc | 540 |
| nggttcnct | acgctnntng | cncctnnntn | ganattttnc | ccgctnngg | naancctcct | 600 |
| gnaatgggta | gggncttntc | tttnaccnn | gnggtntact | aatcnctnc | acgcntnctt | 660 |
| tctnacccc | ccccctttt | caatcccanc | ggcnaatggg | gtctcccn | cgangggggg | 720 |
| nnccannnc | c | | | | | 731 |

<210> 29

<211> 822

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(822)

<223> n = A,T,C or G

<400> 29

| | | | | | | |
|-------------|------------|------------|-------------|------------|------------|-----|
| actagtccag | tgtggtggaa | ttccattgtg | ttggggncnc | ttctatgant | antnttagat | 60 |
| cgctcanacc | tcacancctc | ccnacnangc | ctataangaa | nannaataga | nctgtncnnt | 120 |
| atntntacnc | tcatanncct | cnnnaccac | tcctcttaa | ccntactgt | gcctatngcn | 180 |
| tnnctantct | ntgccgcctn | cnaaccacn | gtgggcnac | cncnngnatt | ctcnatctcc | 240 |
| tcnccatntn | gcctananta | ngtncatacc | ctatacctac | nccaatgcta | nnnctaancn | 300 |
| tcctnannnt | annntaacta | ccactgaent | ngactttcnc | atnanctcct | aatttgaatc | 360 |
| tactctgact | cccacngcct | annnattagc | ancntcccc | nacnatntct | caaccaaadc | 420 |
| ntcaacaacc | tatctanctg | ttcnccaacc | nttncctccg | atccccnnac | aacccccctc | 480 |
| ccaaataccc | nccacctgac | ncctaaccn | caccatccc | gcaagccnan | ggncatttan | 540 |
| ccactggaat | cacnatngga | naaaaaaac | ccnaactctc | tancncnnat | ctccctaana | 600 |
| aatnctcctn | naatttactn | ncantnccat | caancccaacn | tgaaacnnaa | ccccgtttt | 660 |
| tanatccctt | ctttcgaaaa | ccnacccttt | annncccaac | ctttngggcc | cccccnctnc | 720 |
| ccnaatgaag | gncncccaat | cnangaaacg | nccntgaaaa | ancnaggcna | anannntccg | 780 |
| canatccctat | cccttanttn | ggggncctt | nccngggcc | cc | | 822 |

<210> 30

<211> 787

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (787)

<223> n = A,T,C or G

<400> 30

| | | | | | | |
|-------------|------------|-------------|------------|------------|------------|-----|
| cgcccgccctg | ctctggcaca | tgccctcctga | atggcatcaa | aagtgatgga | ctgcccattg | 60 |
| ctagagaaga | ccttctctcc | tactgtcatt | atggagccct | gcagactgag | ggctcccctt | 120 |
| gtctgcagga | tttgatgtct | gaagtcgtgg | agtgtggctt | ggagctcctc | atctacatna | 180 |
| gctggaagcc | ctggagggcc | tctctcgcca | gcctccccct | tctctccacg | ctctccangg | 240 |
| acaccagggg | ctccaggcag | cccattattc | ccagnangac | atggtgtttc | tccacgcgga | 300 |
| cccatggggc | ctgnaaggcc | agggctcctt | ttgacaccat | ctctcccgtc | ctgcctggca | 360 |
| ggcgtgagg | tccactantt | ctanaacggn | cgccaccncg | gtgggagctc | cagcttttgt | 420 |
| tcccnttaat | gaaggttaat | tgncgccttg | gcgtaatcat | nggtcanaac | tntttcctgt | 480 |
| gtgaaattgt | ttntcccctc | ncnatccnc | ncnacatacn | aacccggaan | cataaagtgt | 540 |
| taaagcctgg | gggtngcctn | nngaanaac | tnaactcaat | taattgcgtt | ggctcatggc | 600 |
| ccgctttccn | ttcnggaaaa | ctgtctcccc | ctgcnttntt | gaatcgccca | ccccccnggg | 660 |
| aaaagcggtt | tgcnttttng | ggggntcctt | cncttcccc | cctcnctaan | ccctnccct | 720 |
| cggctcgttnc | nggtngcggg | gaangggnat | nnnctccnc | naagggggng | agnnngntat | 780 |
| ccccaaa | | | | | | 787 |

<210> 31

<211> 799

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (799)

<223> n = A,T,C or G

<400> 31

| | | | | | | |
|------------|------------|------------|------------|-------------|-------------|-----|
| tttttttttt | tttttttggc | gatgctactg | tttaattgca | ggaggtgggg | gtgtgtgtac | 60 |
| catgtaccag | ggctattaga | agcaagaagg | aaggagggag | ggcagagcgc | cctgctgagc | 120 |
| aacaaaggac | tcctgcagcc | ttctctgtct | gtctcttggc | gcaggcacat | ggggaggcct | 180 |
| cccgagggt | gggggccacc | agtccagggg | tgggagcact | acanggggtg | ggagtgggtg | 240 |
| gtggctggtn | cnaatggcct | gncacanatc | cctacgatcc | ttgacacctg | gatttcacca | 300 |
| ggggaccttc | tggtctccca | nggnaacttc | ntnnatctcn | aaagaacaca | actgtttctt | 360 |
| cngcanttct | ggctgttcat | ggaaagcaca | ggtgtccnat | ttnggctggg | acttgggtaca | 420 |
| tatggttccg | gcccacctct | cccntcnaan | aagtaattca | cccccccccn | ccntctnttg | 480 |
| cctgggccct | taantaccca | caccggaact | canttantta | ttcatcttng | gntgggcttg | 540 |
| ntnatcnccn | cctgaangcg | ccaagttgaa | agggcacgcc | gtncnccnctc | cccatagnan | 600 |
| nttttnncnt | canctaatgc | ccccccnggc | aacnatccaa | tccccccccn | tgggggcccc | 660 |
| agcccanggc | ccccgnctcg | ggnnnccngn | cncgnantcc | ccaggntctc | ccantcngnc | 720 |
| ccnnngcncc | cccgcacgca | gaacanaagg | ntngagccnc | cgcannnnnn | nggtnncnac | 780 |
| ctcgccccc | ccnnegng | | | | | 799 |

<210> 32

<211> 789

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (789)

<223> n = A,T,C or G

<400> 32

| | | | | | | |
|------------|-------------|-------------|------------|------------|------------|-----|
| tttttttttt | tttttttttt | tttttttttt | tttttttttt | tttttttttt | tttttttttt | 60 |
| tttttccnag | ggcaggttta | ttgacaacct | cncgggacac | aancaggctg | gggacaggac | 120 |
| ggcaacaggc | tccggcggcg | gcggcggcgg | ccctacctgc | ggtaccaa | ntgcagcctc | 180 |
| cgctcccgt | tgatnttcct | ctgcagctgc | aggatgccnt | aaaacagggc | ctcggccntn | 240 |
| ggtgggcacc | ctgggatttn | aattttccacg | ggcacaatgc | ggtcgcancc | cctcaccacc | 300 |
| nattaggaat | agtggtnnta | cccncncnccg | ttggcncact | ccccntggaa | accacttntc | 360 |
| gcggctccgg | catctggtct | taaaccttgc | aaacnctggg | gccctctttt | tggttantnt | 420 |
| nccngccaca | atcatnactc | agactggcnc | gggctggccc | caaaaaancn | ccccaaaacc | 480 |
| ggnccatgtc | ttnnccgggt | tgctgcnatn | tncatcacct | cccgggcnc | ncaggncaac | 540 |
| ccaaaagttc | ttgngggccn | caaaaaanct | ccggggggnc | ccagtttcaa | caaagtcatc | 600 |
| ccccttggcc | cccaaatacct | ccccccgntt | nctgggtttg | ggaacccacg | cctctnnctt | 660 |
| tggngggcaa | gntggntccc | ccttcggggc | cccgggtggc | ccnnctctaa | ngaaaaacnc | 720 |
| ntcctnnnca | ccatcccccc | nngnnacgnc | tancaangna | tccctttttt | tanaaacggg | 780 |
| ccccccnccg | | | | | | 789 |

<210> 33

<211> 793

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(793)

<223> n = A,T,C or G

<400> 33

| | | | | | | |
|-------------|-------------|------------|-------------|------------|------------|-----|
| gacagaacat | ggtggatggt | ggagcacctt | tctatacgac | ttacaggaca | gcagatgggg | 60 |
| aattcatggc | tggtggagca | atanaacccc | agttctacga | gctgctgac | aaaggacttg | 120 |
| gactaaagtc | tgatgaactt | cccaatcaga | tgagcatgga | tgattggcca | gaaatgaana | 180 |
| agaagtttgc | agatgtat | gcaaagaaga | cgaaggcaga | gtggtgtcaa | atctttgacg | 240 |
| gcacagatgc | ctgtgtgact | ccggttctga | cttttgagga | ggtgttcat | catgatcaca | 300 |
| acaangaacg | gggctcgttt | atcaccantg | aggagcagga | cgtgagcccc | cgccctgcac | 360 |
| ctctgctgtt | aaacacccca | gccatccctt | ctttcaaaaag | ggatccacta | cttctagagc | 420 |
| ggnccgccacc | gcgggtggagc | tccagctttt | gttcccttta | gtgaggggta | attgcgcgct | 480 |
| tggcgtaatc | atgggtcatan | ctgtttcctg | tgtgaaattg | ttatccgctc | acaattccac | 540 |
| acaacatacg | anccggaagc | atnaaatttt | aaagcctggg | ggtngccta | tgantgaact | 600 |
| nactcacatt | aattggcttt | gcgctcactg | cccgttttcc | agtccggaaa | acctgtcctt | 660 |
| gccagctgcc | nttaatgaat | cnggccaccc | cccggggaaa | aggcngtttg | cttnttgggg | 720 |
| cgcncctccc | gctttctcgc | ttcctgaant | ccttcccccc | ggtcttttcg | cttgcggcna | 780 |
| acggtatcna | cct | | | | | 793 |

<210> 34

<211> 756

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(756)

<223> n = A,T,C or G

<400> 34

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| gccgcgaccg | gcatgtacga | gcaactcaag | ggcgagtggg | accgtaaaag | ccccaatctt | 60 |
| ancaagtgcg | gggaanagct | gggtcgactc | aagctagttc | ttctggagct | caacttcttg | 120 |

| | | | | | | |
|-------------|------------|------------|-------------|-------------|------------|-----|
| ccaaccacag | ggaccaagct | gaccaaacag | cagctaattc | tggcccggtga | catactggag | 180 |
| atcgggggccc | aatggagcat | cctacgcaan | gacatccccct | ccttcgagcg | ctacatggcc | 240 |
| cagctcaaat | gctactactt | tgattacaan | gagcagctcc | ccgagtcagc | ctatatgcac | 300 |
| cagctcttgg | gcctcaacct | cctcttcctg | ctgtcccaga | accgggtggc | tgantnccac | 360 |
| acgganttgg | ancggctgcc | tgcccaanga | catacanacc | aatgtctaca | tcnaccacca | 420 |
| gtgtcctgga | gcaatactga | tgganggcag | ctaccncaaa | gtnttcctgg | ccnagggtaa | 480 |
| catccccgcg | cgagagctac | accttcttca | ttgacatcct | gctcgacact | atcagggatg | 540 |
| aaaatcgcn | ggttgctcca | gaaaggctnc | aanaanattc | tttctnctga | aggcccccg | 600 |
| atnncntagt | nctagaatcg | gcccgcctac | gcggtgganc | ctccaacctt | tcgttnccct | 660 |
| ttactgaggg | ttnattgccg | cccttggcgt | tatcatggtc | acnccngttn | cctgtgttga | 720 |
| aattnttaac | ccccacaaat | tccacgccna | cattnng | | | 756 |

<210> 35

<211> 834

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(834)

<223> n = A,T,C or G

<400> 35

| | | | | | | |
|------------|------------|-------------|-------------|-------------|------------|-----|
| ggggatctct | anatcnacct | gnatgcatgg | ttgtcgggtgt | ggtcgctgtc | gatgaanatg | 60 |
| aacaggatct | tgcccttgaa | gctctcggct | gctgtnttta | agttgctcag | tctgccgtca | 120 |
| tagtcagaca | cncctctggg | caaaaaacan | caggatntga | gtcttgattt | cacctccaat | 180 |
| aatcttcngg | gctgtctgct | cgggtgaactc | gatgacnang | ggcagctggg | tgtgtntgat | 240 |
| aaantccanc | angttctcct | tggtgacctc | cccttcaaag | ttgttcgggc | cttcatcaaa | 300 |
| cttctnnaan | angannancc | canctttgtc | gagctggnat | ttgganaaca | cgtcacrgtt | 360 |
| ggaaactgat | cccaaattgg | atgtcatcca | tcgcctctgc | tgccctgcaaa | aaacttgctt | 420 |
| ggcncaaata | cgaactcccn | tccttgaaag | aagccnatca | cacccccctc | cctggactcc | 480 |
| nncaangact | ctnccgctnc | cccntccnng | cagggttggg | ggcannccgg | gccntgcgc | 540 |
| ttcttcagcc | agttcacnat | nttcacagc | ccctctgcc | gctgttntat | tccttggggg | 600 |
| ggaanccgtc | tctcccttcc | tgaannaact | ttgaccgtng | gaatagccgc | gcntcnccnt | 660 |
| acntnctggg | cggggttcaa | antccctccn | ttgncnntcn | cctcgggcca | ttctggattt | 720 |
| nccnaacttt | tctcttcccc | cncctccnng | ngtttgntt | tttcatnggg | ccccaaactc | 780 |
| gctnttggcc | antccctggg | gggcntntan | cncctccnt | ggtcccntng | ggcc | 834 |

<210> 36

<211> 814

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(814)

<223> n = A,T,C or G

<400> 36

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| cgngcgtttt | cngccgcgc | cccgtttcca | tgacnaaggc | tcccttcang | ttaaatacn | 60 |
| cctagnaaac | attaatgggt | tgtctacta | atacatcata | cnaaccagta | agcctgccc | 120 |
| naacgccaac | tcaggccatt | cctaccaaag | gaagaaaggc | tggtctctcc | acccctgta | 180 |
| ggaaaggcct | gccttgtaag | acaccacaat | ncggctgaat | ctnaagtctt | gtgttttact | 240 |
| aatggaaaaa | aaaaataaac | aanaggtttt | gttctcatgg | ctgcccaccg | cagcctggca | 300 |
| ctaaaacanc | ccagcgctca | cttctgcttg | ganaaatatt | ctttgctctt | ttggacatca | 360 |

```

ggcttgatgg tatcactgcc acntttccac ccagctgggc ncccttcccc catntttgtc      420
antganctgg aaggcctgaa ncttagcttc caaaagtctc ngcccacaag accggccacc      480
aggggangtc ntttncagtg gatctgccaa anantaccn tatcatcnnt gaataaaaag      540
gcccctgaac ganatgcttc cancanctt taagacccat aatcctngaa ccattggtgcc      600
cttccgggtct gatccnaaag gaatgttctt ggggtccant ccttcctttg ttntttacgt      660
tgtnttggaac cntgctngn atnaccaan tganatcccc ngaagcacc tccccctggc      720
atgtganttt cntaaattct ctgccctacn nctgaaagca cnattccctn ggcncnaa      780
ggngaactca agaaggtctn ngaaaaacca cncn                                814

```

<210> 37

<211> 760

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(760)

<223> n = A,T,C or G

<400> 37

```

gcattgctgct cttcctcaaa gttgttcttg ttgccataac aaccaccata ggtaaagcgg      60
gcgcagtgtt cgctgaaggg gttgtagtac cagcgcggga tgctctcctt gcagagtcct      120
gtgtctggca ggtccacgca atgccctttg tctctgggga aatggatgcg ctggagctcg      180
tcnaanccac tcgtgtattt ttcacangca gcctcctccg aagcntccgg gcagttgggg      240
gtgtcgtcac actccactaa actgtcgatn cancagccca ttgctgcagc ggaactgggt      300
gggctgacag gtgccagaac aactggatn ggcctttcca tggaagggcc tgggggaaat      360
cncctnancc caaactgcct ctcaaaggcc accttgcaca ccccgacagg ctagaaatgc      420
actcttcttc ccaaaggtag ttgttcttgt tgcccaagca ncctccancc aacccaaanc      480
ttgcaaaatc tgctccgtgg gggcatnnn taccanggtt ggggaaanaa acccggcngn      540
ganccnctt gtttgaatgc naaggnaata atcctcctgt cttgcttggg tggaanagca      600
caattgaact gttaacnttg ggccnggttc cncctnggtg gtctgaaact aatcacctgc      660
actggaaaaa ggtangtgcc ttccttgaat tcccaaantt cccctngntt tgggtntttt      720
ctcctctncc ctaaaaatcg tnttcccccc cntanggcg                                760

```

<210> 38

<211> 724

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(724)

<223> n = A,T,C or G

<400> 38

```

tttttttttt tttttttttt tttttttttt tttttaaaaa cccctccat tgaatgaaaa      60
cttcnaaat tgccaaccc cctcnccaa atnnccattt cggggggggg gttccaaacc      120
caaattaatt ttgganttta aattaaatn tnatnngggg aanaanccaa atgtnaagaa      180
aatttaaccc attatnaact taaatnccn gaaacccntg gnttccaaa atttttaacc      240
cttaaatccc tccgaaattg ntaanggaaa accaaattcn cctaaggctn tttgaaggtt      300
ngatttaaac ccccttnant tnttttnacc cnnngctnaa ntatttngnt tccggtgttt      360
tcctnttaan cntnggtaac tcccngtaat gaannnccct aanccaatta aaccgaattt      420
tttttgaatt ggaaattccn ngggaattna cgggggtttt tcccnttttg gggccatncc      480
ccncttttcg ggggttgggn ntaggttgaa tttttnnang nccccaaaaa ncccccaana      540
aaaaaactcc caagnnttaa ttngaantnc ccccttccca ggccttttgg gaaaggnggg      600

```

```

tttntggggg ccngggantt cnttcccccn ttncncccc cccccnggt aaanggttat 660
ngnntttggt ttttgggccc cttnanggac cttccggatn gaaattaaat ccccggnncg 720
gccg 724

```

```

<210> 39
<211> 751
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(751)
<223> n = A,T,C or G

```

```

<400> 39
tttttttttt tttttctttg ctcacattta atttttattt tgattttttt taatgctgca 60
caacacaata tttatttcat ttgtttcttt tatttcattt tatttgtttg ctgctgctgt 120
tttatttatt tttactgaaa gtgagaggga acttttgttg ctttttttcc tttttctgta 180
ggcgcgctta agctttctaa atttggaaac tctaagcaag ctgaanggaa aaggggggtt 240
cgcaaaatca ctcgggggaa nggaaagggt gctttgttaa tcatgcccta tggtggtgta 300
ttaactgctt gtacaattac ntttcacttt taattaattg tgctnaangc ttttaattana 360
cttggggggt ccctcccccac accaaccnccn ctgacaaaaa gtgccngccc tcaaatnatg 420
tccccgcnnt cnttgaaaca cacngcngaa ngttctcatt ntcccnccnc caggtnaaaa 480
tgaagggtta ccatntttta cncacctcc acntggcnnn gcctgaatcc tcnaaaancn 540
ccctcaancn aattnctnng ccccggtcnc gcntnngtc cncgggggt cggggaantn 600
caccnccnga annnntnnc naacnaaatt ccgaaaatat tccnntcnc tcaattcccc 660
cnnagactnt cctcnnncn cncaattttc ttttntcac gaacncgnnc cnnaaatgn 720
nnnnncctc cncnngtcn naatcnccan c 751

```

```

<210> 40
<211> 753
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(753)
<223> n = A,T,C or G

```

```

<400> 40
gtggtatttt ctgtaagatc aggtgttctt ccctcgtagg tttagaggaa acaccctcat 60
agatgaaaac ccccccgaga cagcagcact gcaactgcc aagcagccggg gtaggagggg 120
cgccctatgc acagctgggc ctttgagaca gcagggttc gatgtcaggc tcgatgtcaa 180
tgggtctggaa gcggcggttg tacctgcgta ggggcacacc gtcaggggcc accaggaaact 240
tctcaaagtt ccaggcaacn tcgttgcgac acaccggaga ccagggtgatn agcttggggt 300
cggtcataan cgcggtggcg tcgtcgttg gagctggcag ggctccccg aggaaggcna 360
ataaaagggt cgcccccgca ccgttcantc cgcacttctc naanaccatg angttgggct 420
cnaaccacc accannccgg acttccttga nggaattccc aaatctcttc gntcttgggc 480
ttctnctgat gccctantg gtgcccngn atgccaanca nccccancc cgggggtcct 540
aaanaccncc cctcctcntt tcatctgggt tntntcccc ggaccntggg tccctcaag 600
ggancccata tctcnaccn tactcaacct nccccccnt gnnaccanc cttctanngn 660
tccnccccg ncctctggcc cntcaaan gcttnacna cctgggtctg ccttcccccc 720
tnccctatct gnaccnccn tttgtctcan tnt 753

```

```

<210> 41

```

<211> 341

<212> DNA

<213> Homo sapien

<400> 41

| | |
|---|-----|
| actatatcca tcacaacaga catgcttcat cccatagact tcttgacata gcttcaaagt | 60 |
| agtgaaccca tccttgattt atatacatat atgttctcag tattttggga gcctttccac | 120 |
| ttctttaaac cttgttcatt atgaacactg aaaataggaa tttgtgaaga gttaaaaagt | 180 |
| tatagcttgt ttacgtagta agtttttgaa gtctacattc aatccagaca cttagttgag | 240 |
| tgttaaactg tgatttttaa aaaatatcat ttgagaatat tctttcagag gtattttcat | 300 |
| ttttactttt tgattaattg tgttttatat attagggtag t | 341 |

<210> 42

<211> 101

<212> DNA

<213> Homo sapien

<400> 42

| | |
|---|-----|
| acttactgaa tttagttctg tgctcttctt tatttagtgt tgtatcataa atactttgat | 60 |
| gtttcaaaca ttctaaataa ataattttca gtggcttcat a | 101 |

<210> 43

<211> 305

<212> DNA

<213> Homo sapien

<400> 43

| | |
|--|-----|
| acatctttgt tacagtctaa gatgtgttct taaatcacca ttccttctctg gtccctaccc | 60 |
| tccagggtgg tctcacactg taattagagc tattgaggag tctttacagc aaattaagat | 120 |
| tcagatgcct tgctaagtct agagttctag agttatgttt cagaaagtct aagaaaccca | 180 |
| cctcttgaga ggtcagtaaa gaggacttaa tatttcatat ctacaaaatg accacaggat | 240 |
| tggatacaga acgagagtta tcctggataa ctcagagctg agtacctgcc cgggggccgc | 300 |
| tcgaa | 305 |

<210> 44

<211> 852

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(852)

<223> n = A,T,C or G

<400> 44

| | |
|--|-----|
| acataaatat cagagaaaag tagtctttga aatatttacg tccaggagtt ctttgtttct | 60 |
| gattatttgg tgtgtgtttt ggtttgtgtc caaagtattg gcagcttcag ttttcatttt | 120 |
| ctctccatcc tcgggcattc ttcccaaatt tatataccag tcttcgtcca tccacacgct | 180 |
| ccagaatttc tctttttag tagtatctca tagctcggct gagcttttca taggtcatgc | 240 |
| tgctgttgtt cttcttttta ccccatagct gagccactgc ctctgatttc aagaacctga | 300 |
| agacgcctc agatcgggtc tcccatttta ttaatcctgg gttcttgtct gggttcaaga | 360 |
| ggatgtcgcg gatgaattcc cataagttag tccctctcgg gttgtgcttt ttggtgtggc | 420 |
| acttggcagg ggggtcttgc tcttttttca tatcagggtga ctctgcaaca ggaaggtgac | 480 |
| tggtgggtgt catggagatc tgagcccggc agaaagtttt gctgtccaac aaatctactg | 540 |
| tgctaccata gttgggtgtc tataaatagt tctngtcttt ccagggtgtc atgatggaag | 600 |

| | | | | | | |
|------------|-------------|------------|-------------|-------------|------------|-----|
| gctcagtttg | ttcagtccttg | acaatgacat | tgtgtgtgga | ctggaacagg | tcactactgc | 660 |
| actggccggt | ccacttcaga | tgctgcaagt | tgctgtagag | gagntgcccc | gccgtccctg | 720 |
| ccgcccgggt | gaactcctgc | aaactcatgc | tgcaaagggtg | ctcgccgttg | atgtcgaact | 780 |
| cntggaaagg | gatacaattg | gcatccagct | ggttggtgtc | caggagggtga | tggagccact | 840 |
| cccacacctg | gt | | | | | 852 |

<210> 45
 <211> 234
 <212> DNA
 <213> Homo sapien

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| <400> 45 | | | | | | |
| acaacagacc | cttgctcgct | aacgacctca | tgctcatcaa | gttggacgaa | tccgtgtccg | 60 |
| agtctgacac | catccggagc | atcagcattg | cttcgcagtg | ccctaccgcg | gggaactctt | 120 |
| gcctcgtttc | tggtggggt | ctgctggcga | acggcagaat | gcctaccgtg | ctgcagtgcg | 180 |
| tgaacgtgtc | ggtggtgtct | gaggaggctc | gcagtaagct | ctatgacctg | ctgt | 234 |

<210> 46
 <211> 590
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (590)
 <223> n = A,T,C or G

| | | | | | | |
|------------|------------|------------|-------------|------------|------------|-----|
| <400> 46 | | | | | | |
| actttttatt | taaatgttta | taaggcagat | ctatgagaat | gatagaaaac | atggtgtgta | 60 |
| atttgatagc | aatattttgg | agattacaga | gttttagtaa | ttaccaatta | cacagttaaa | 120 |
| aagaagataa | tatattccaa | gcanatacaa | aatatctaata | gaaagatcaa | ggcaggaaaa | 180 |
| tgantataac | taattgacaa | tggaaaatca | attttaatgt | gaattgcaca | ttatccttta | 240 |
| aaagctttca | aaanaanaaa | ttattgcagt | ctanttaatt | caaacagtgt | taaatggat | 300 |
| caggataaan | aactgaagg | canaaagaat | taattttcac | ttcatgtaac | ncacccanat | 360 |
| ttacaatggc | ttaaatgcan | ggaaaaagca | gtggaagtga | ggaagtantc | aaggtctttc | 420 |
| tggtctctaa | tctgccttac | tctttgggtg | tggctttgat | cctctggaga | cagctgccag | 480 |
| ggctcctgtt | atatccacaa | tcccagcagc | aagatgaagg | gatgaaaaag | gacacatgct | 540 |
| gccttccttt | gaggagactt | catctcactg | gccaacactc | agtcacatgt | | 590 |

<210> 47
 <211> 774
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (774)
 <223> n = A,T,C or G

| | | | | | | |
|------------|------------|-------------|-------------|------------|------------|-----|
| <400> 47 | | | | | | |
| acaagggggc | ataatgaagg | agtggggana | gatttttaaag | aaggaaaaaa | aacgaggccc | 60 |
| tgaacagaat | tttcctgnac | aacggggcctt | caaaataatt | ttcttgggga | ggttcaagac | 120 |
| gcttcactgc | ttgaaactta | aatggatgtg | ggacanaatt | ttctgtaatg | accctgaggg | 180 |
| cattacagac | gggactctgg | gaggaaggat | aaacagaaaag | gggacaaaag | ctaataccaa | 240 |
| aacatcaaa | aaaggaagg | ggcgtcatat | ctcccagcct | acacagttct | ccagggtctt | 300 |


```

cctcatccct ggaggacgac agtggaggaa caactgacca tgtccccagg ctctgtgtg      360
ctggctcctg gtcttcagcc cccagctctg gaagcccacc ctctgctgat cctgcgtggc      420
ccacactcct tgaacacaca tccccagggt atattcctgg acatggctga acctcctatt      480
cctacttccg agatgccttg ctccctgcag cctgtcaaaa tcccactcac cctccaaacc      540
acggcatggg aagcctttct gacttgcttg attactccag catcttggaa caatccctga      600
ttccccactc cttagaggca agataggggt gttaagagta gggctggacc acttgagacc      660
aggctgctgg cttcaaattt tggctcattt acgagctatg ggaccttggg caagtnatct      720
tcactttctat gggcntcatt ttgttctacc tgcaaaatgg gggataataa tagt          774

```

<210> 48

<211> 124

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(124)

<223> n = A,T,C or G

<400> 48

```

canaaattga aattttataa aaaggcattt ttctcttata tccataaaat gatataattt      60
ttgcaantat anaaatgtgt cataaattat aatgttcctt aattacagct caacgcaact      120
tggt                                              124

```

<210> 49

<211> 147

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(147)

<223> n = A,T,C or G

<400> 49

```

gccgatgcta ctattttatt gcaggagggt ggggtgtttt tattattctc tcaacagctt      60
tgtggctaca ggtgggtgtct gactgcatna aaaanttttt tacgggtgat tgcaaaaatt      120
ttagggcacc catatcccaa gcantgt                                              147

```

<210> 50

<211> 107

<212> DNA

<213> Homo sapien

<400> 50

```

acattaaatt aataaaagga ctgttgggggt tctgctaaaa cacatggctt gatatatattgc      60
atggtttgag gttaggagga gttaggcata tgttttggga gaggggt                      107

```

<210> 51

<211> 204

<212> DNA

<213> Homo sapien

<400> 51

```

gtcctaggaa gtctagggga cacacgactc tggggtcacg gggccgacac acttgcacgg      60

```

```

cgggaaggaa aggcagagaa gtgacaccgt caggggggaaa tgacagaaaag gaaaatcaag      120
gccttgcaag gtcagaaagg ggactcaggg cttccaccac agccctgccc cacttgGCCA      180
cctccctttt gggaccagca atgt                                           204

```

<210> 52

<211> 491

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(491)

<223> n = A,T,C or G

<400> 52

```

acaaagataa catTTatctt ataacaāaaa tttgatagtt ttaaaggTTa gtattgtgta      60
gggtatttttC caaaagacta aagagataac tcaggTaaaa agttagaaat gtataaaaca      120
ccatcagaca ggTTTTttaa aaacaacata ttacaaatt agacaatcat ccttaaaaaa      180
aaaacttctt gtatcaattt cttttgttca aaatgactga cttaantatt tttaaatatt      240
tcanaaacac ttctcaaaa attttcaana tggtagcttt canatgtncC ctcagtccca      300
atgttgctca gataaataaa tctcgtgaga acttaccacc caccacaagc tttctggggc      360
atgcaacagt gtcttttctt tncTTTTtct ttttttttt ttacaggcac agaaactcat      420
caattttatt tggataacaa agggTctcca aattatattg aaaaataaat ccaagttaat      480
atcactcttg t                                           491

```

<210> 53

<211> 484

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(484)

<223> n = A,T,C or G

<400> 53

```

acataattta gcagggctaa ttaccataag atgctattta ttaanaggtn tatgatctga      60
gtattaacag ttgctgaagt ttggTatttt tatgcagcat tttctttttg ctttgataac      120
actacagaac ccttaaggac actgaaatt agtaagtaaa gttcagaaac attagctgct      180
caatcaaattC tctacataac actatagtaa ttaaaacggt aaaaaaaagt gttgaaatct      240
gcactagtat anaccgctcc tgtcaggata anactgcttt ggaacagaaa gggaaaaanc      300
agctttgant ttctttgtgc tgatangagg aaaggctgaa ttacctgtt gcctctccct      360
aatgattggc aggtcnggta aatnccaaaa catattccaa ctcaacactt cttttccncg      420
tancttgant ctgtgtattc caggancagg cggatggaat gggccagccc ncggatgttc      480
cant                                           484

```

<210> 54

<211> 151

<212> DNA

<213> Homo sapien

<400> 54

```

actaaacctc gtgcttgTga actccataca gaaaacggTg ccatccctga acacggctgg      60
ccactgggta tactgctgac aaccgcaaca acaaaaacac aaatccttgg cactggctag      120
tctatgtcct ctcaagtgcc tttttgtttg t                                           151

```

<210> 55
<211> 91
<212> DNA
<213> Homo sapien

<400> 55
acctggcttg tctccgggtg gttcccggcg cccccacgg tccccagaac ggacactttc 60
gccctccagt ggatactcga gccaaagtgg t 91

<210> 56
<211> 133
<212> DNA
<213> Homo sapien

<400> 56
ggcggatgtg cgttggttat atacaaatat gtcattttat gtaagggact tgagtatact 60
tggatttttg gtatctgtgg gttgggggga cgggccagga accaataccc catggatacc 120
aagggacaac tgt 133

<210> 57
<211> 147
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(147)
<223> n = A,T,C or G

<400> 57
actctggaga acctgagccg ctgctccgcc tctgggatga ggtgatgcan gcngtggcgc 60
gactgggagc tgagcccttc ctttgcgcc tgcctcagag gattgttgcc gacntgcana 120
tctcantggg ctggatncat gcagggt 147

<210> 58
<211> 198
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(198)
<223> n = A,T,C or G

<400> 58
acagggatat aggtttnaag ttattgtnat tgtaaaatac attgaatttt ctgtatactc 60
tgattacata catttatcct ttaaaaaaga tgtaaatctt aatttttatg ccatctatta 120
atttaccat gagttacctt gtaaatgaga agtcatgata gcactgaatt ttaactagtt 180
ttgacttcta agtttggt 198

<210> 59
<211> 330
<212> DNA
<213> Homo sapien

<400> 59
 acaacaaatg ggttgtagg aagtcttata agcaaaactg gtgatggcta ctgaaaagat 60
 ccattgaaaa ttatcattaa tgattttaaa tgacaagtta tcaaaaactc actcaatttt 120
 cacctgtgct agcttgctaa aatgggagtt aactctagag caaatatagt atcttctgaa 180
 tacagtcaat aaatgacaaa gccagggcct acagggtggtt tccagacttt ccagacccag 240
 cagaaggaat ctattttatc acatggatct ccgtctgtgc tcaaaatacc taatgatatt 300
 ttcgtctttt attggacttc tttgaagagt 330

<210> 60
 <211> 175
 <212> DNA
 <213> Homo sapien

<400> 60
 accgtgggtg cttctacat tcctgacggc tccttcacca acatctggtt ctacttcggc 60
 gtcgtgggct cttctctctt catcctcatc cagctggtgc tgctcatcga ctttgcgcac 120
 tcctggaacc agcgggtggc gggcaaggcc gaggagtgcg attcccgtgc ctggt 175

<210> 61
 <211> 154
 <212> DNA
 <213> Homo sapien

<400> 61
 accccacttt tcctcctgtg agcagtcctg acttctcact gctacatgat gagggtagt 60
 ggttggtgct cttcaacagt atcctcccct ttccggatct gctgagccgg acagcagtgc 120
 tggactgcac agccccgggg ctccacattg ctgt 154

<210> 62
 <211> 30
 <212> DNA
 <213> Homo sapien

<400> 62
 cgctcgagcc ctatagtgag tcgtattaga 30

<210> 63
 <211> 89
 <212> DNA
 <213> Homo sapien

<400> 63
 acaagtcatt tcagcaccct ttgctcttca aaactgacca tcttttatat ttaatgcttc 60
 ctgtatgaat aaaaatggtt atgtcaagt 89

<210> 64
 <211> 97
 <212> DNA
 <213> Homo sapien

<400> 64
 accggagtaa ctgagtcggg acgctgaatc tgaatccacc aataaataaa ggttctgcag 60
 aatcagtgc tccaggattg gtccttgat ctgggggt 97

<210> 65
<211> 377
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (377)
<223> n = A,T,C or G

<400> 65
acaacaanaa ntcccttctt taggccactg atggaaacct ggaaccccct tttgatggca 60
gcatggcgct ctaggccttg acacagcggc tgggggtttgg gctntcccaa accgcacacc 120
ccaaccctgg tctaccaca nttctggcta tgggctgtct ctgccactga acatcagggg 180
tcggtcataa natgaaatcc caanggggac agaggtcagt agaggaagct caatgagaaa 240
ggtgctgttt gctcagccag aaaacagctg cctggcattc gccgctgaac tatgaacccg 300
tgggggtgaa ctaccccccag gaggaatcat gcctgggcga tgcaanggtg ccaacaggag 360
gggcgggagg agcatgt 377

<210> 66
<211> 305
<212> DNA
<213> Homo sapien

<400> 66
acgcctttcc ctccagaattc agggaagaga ctgtcgcttg ccttcctccg ttgttgctg 60
agaacccgtg tgcccttcc caccatatcc accctcgctc catctttgaa ctcaaacacg 120
aggaactaac tgcacccctgg tcctctcccc agtccccagt tcacccctcca tccctcacct 180
tcctccactc taagggatat caacactgcc cagcacaggg gccctgaatt tatgtggttt 240
ttatatattt ttaataaaga tgcactttat gtcatttttt aataaagtct gaagaattac 300
tgttt 305

<210> 67
<211> 385
<212> DNA
<213> Homo sapien

<400> 67
actacacaca ctccacttgc ccttgtgaga cactttgtcc cagcacttta ggaatgctga 60
ggtcggacca gccacatctc atgtgcaaga ttgccagca gacatcaggt ctgagagttc 120
cccttttaaa aaaggggact tgcttaaaaa agaagtctag ccacgattgt gtagagcagc 180
tgtgctgtgc tggagattca cttttgagag agttctctc tgagacctga tctttagagg 240
ctgggcagtc ttgcacatga gatggggctg gtctgatctc agcactcctt agtctgcttg 300
cctctcccag ggccccagcc tggccacacc tgcttacagg gcactctcag atgcccatat 360
catagtttct gtgctagtgg accgt 385

<210> 68
<211> 73
<212> DNA
<213> Homo sapien

<400> 68
acttaaccag atatattttt accccagatg gggatattct ttgtaaaaaa tgaaaataaa 60
gttttttttaa tgg 73

<210> 69
<211> 536
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(536)
<223> n = A,T,C or G

<400> 69
actagtccag tgtggtggaa ttccattgtg ttgggggctc tcaccctcct ctctgcagc 60
tccagctttg tgctctgcct ctgaggagac catggcccag catctgagta ccctgctgct 120
cctgctggcc accctagctg tggccctggc ctggagcccc aaggaggagg ataggataat 180
cccgggtggc atctataacg cagacctcaa tgatgagtgg gtacagcgtg cccttcactt 240
cgccatcagc gagtataaca aggccaccaa agatgactac tacagacgtc cgctgcgggg 300
actaagagcc aggcaacaga ccgttggggg ggtgaattac ttcttcgacg tagagggtggg 360
ccgaaccata tgtaccaagt cccagcccaa cttggacacc tgtgccttcc atgaacagcc 420
agaactgcag aagaaacagt tgtgctcttt cgagatctac gaagttccct ggggagaaca 480
gaangtcctt gggtgaaatc caggtgtcaa gaaatcctan ggatctgttg ccaggc 536

<210> 70
<211> 477
<212> DNA
<213> Homo sapien

<400> 70
atgaccctta acaggggccc tctcagccct cctaattgacc tccggcctag ccatgtgatt 60
tcacttccac tccataacgc tcttcatact aggcctacta accaacacac taaccatata 120
ccaatgatgg cgcgatgtaa cagagaaaag cacataccaa ggccaccaca caccacctgt 180
ccaaaaaggc cttcgatacg ggataatcct atttattacc tcagaagttt ttttcttcgc 240
agggattttt ctgagccttt taccactcca gcctagcccc taccctccaa ctaggaggggc 300
actggcccc aacaggcatc accccgctaa atcccctaga agtcccactc ctaaaccat 360
ccgtattact cgcatacagga gtatcaatca cctgagctca ccatagtcta atagaaaaca 420
accgaaacca aattattcaa agcactgctt attacaattt tactgggtct ctatttt 477

<210> 71
<211> 533
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(533)
<223> n = A,T,C or G

<400> 71
agagctatag gtacagtgtg atctcagctt tgcaaacaca ttttctacat agatagtact 60
aggtattaat agatatgtaa agaaagaaat cacaccatta ataattgtaa gattggttta 120
tgtgattttt tgggtatttt tggcaccctt atatattgtt tccaaacttt cagcagtgat 180
attattttcca taacttaaaa agtgagtgtg aaaaagaaaa tctccagcaa gcattctcatt 240
taataaaagg tttgtcatct ttaaaaatac agcaatatgt gactttttta aaaagctgtc 300
aaatagggtg gaccctacta ataattatta gaaatacatt taaaaacatc gagtacctca 360
agtcagtttg ccttgaaaaa tatcaaatat aactcctaga gaaatgtaca taaaagaatg 420
cttcgtaatt ttggagtang aggttccctc ctcaattttg tattttttaa aagtacatgg 480
taaaaaaaaa aattcacaaac agtatataag gctgtaaaat gaagaattct gcc 533

<210> 72
 <211> 511
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(511)
 <223> n = A,T,C or G

<400> 72
 tattacggaa aaacacacca cataattcaa ctancaaaga anactgcttc agggcgtgta 60
 aaatgaaagg cttccaggca gttatctgat taaagaacac taaaagaggg acaaggctaa 120
 aagccgcagg atgtctacac tatancaggc gctatttggg ttggctggag gagctgtgga 180
 aaacatggan agattggtgc tgganatcgc cgtggctatt cctcattggt attacanagt 240
 gaggttctct gtgtgcccac tggtttgaaa accgttctnc aataatgata gaatagtaca 300
 cacatgagaa ctgaaatggc ccaaaccag aaagaaagcc caactagatc ctcagaanac 360
 gcttctaggg acaataaccg atgaagaaaa gatggcctcc ttgtgcccc gtctgttatg 420
 atttctctcc attgcagcna naaaccggtt cttctaagca aacncagggtg atgatggcna 480
 aaatacaccc cctcttgaag naccnggagg a 511

<210> 73
 <211> 499
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(499)
 <223> n = A,T,C or G

<400> 73
 cagtgccagc actggtgcca gtaccagtag caataacagt gccagtgccg gtgccagcac 60
 cagtgggtggc ttcagtgtg gtgccagcct gaccgccact ctcacatttg ggctcttcgc 120
 tggccttggt ggagctggtg ccagcaccag tggcagctct ggtgcctgtg gtttctccta 180
 caagttagat tttagatatt gttaatcctg ccagtctttc tcttcaagcc aggtgcatc 240
 ctcagaaacc tactcaacac agcactctag gcagccacta tcaatcaatt gaagtgcaca 300
 ctctgcatta aatctatttg ccatttctga aaaaaaaaaa aaaaaaaggg cggccgctcg 360
 antctagagg gcccgtttaa acccgctgat cagcctcgac tgtgccttct anttgccagc 420
 catctgttgt ttgccctcc cccgntgcct tccttgacct tggaaagtgc cactccact 480
 gtcctttcct aantaaat 499

<210> 74
 <211> 537
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(537)
 <223> n = A,T,C or G

<400> 74
 tttcatagga gaacacactg aggagatact tgaagaattt ggattcagcc gcgaagagat 60

```

ttatcagctt aactcagata aaatcattga aagtaataag gtaaaagcta gtctctaact 120
tccaggccca cggctcaagt gaatttgaat actgcattta cagtgtagag taacacataa 180
cattgtatgc atggaaacat ggaggaacag tattacagtg tcctaccact ctaatcaaga 240
aaagaattac agactctgat tctacagtga tgattgaatt ctaaaaatgg taatcattag 300
ggcttttgat ttataanact ttgggtactt atactaaatt atggtagtta tactgccttc 360
cagtttgctt gatataattg ttgatattaa gattcttgac ttatatattg aatgggttct 420
actgaaaaan gaatgatata ttcttgaaga catcgatata catttattta cactcttgat 480
tctacaatgt agaaaatgaa ggaaatgccc caaattgtat ggtgataaaa gtcccgt 537

```

<210> 75

<211> 467

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(467)

<223> n = A,T,C or G

<400> 75

```

caaanacaat tgttcaaaag atgcaaatga tacactactg ctgcagctca caaacacctc 60
tgcattattac acgtacctcc tcctgctcct caagtagtgt ggtctatttt gccatcatca 120
cctgctgtct gcttagaaga acggctttct gctgcaangg agagaaatca taacagacgg 180
tggcacaagg aggccatctt ttctcatcgt gttattgtcc ctagaagcgt cttctgagga 240
tctagttggg ctttctttct gggtttgggc catttcantt ctcatgtgtg tactattcta 300
tcattattgt ataacgggtt tcaaaccngt gggcagncag agaacctcac tctgtaataa 360
caatgaggaa tagccacggt gatctccagc accaaatctc tccatgttnt tccagagctc 420
ctccagccaa cccaaatagc cgctgctatn gtgtagaaca tccctgn 467

```

<210> 76

<211> 400

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(400)

<223> n = A,T,C or G

<400> 76

```

aagctgacag cattcggggc gagatgtctc gctccgtggc cttagctgtg ctgcgctac 60
tctctctttc tggcctggag gctatccagc gtactccaaa gattcaggtt tactcacgtc 120
atccagcaga gaatggaaag tcaaatttcc tgaattgcta tgtgtctggg ttcatccat 180
ccgacattga agttgactta ctgaagaatg gagagagaat tgaaaaagtg gagcattcag 240
acttgtcttt cagcaaggac tgggtctttct atctcttgta ctacactgaa ttcaccccca 300
ctgaaaaaga tgagtatgcc tgccgtgtga accatgtgac tttgtcacag cccaagatng 360
ttnagtggga tcganacatg taagcagcan catgggaggt 400

```

<210> 77

<211> 248

<212> DNA

<213> Homo sapien

<400> 77

```

ctggagtgcc ttggtgtttc aagcccctgc aggaagcaga atgcaccttc tgaggcacct 60

```



```

ccagctgccc cggcggggga tgcgaggctc ggagcaccct tgcccggctg tgattgctgc      120
caggcactgt tcatctcagc ttttctgtcc ctttgctccc ggcaagcgct tctgctgaaa      180
gttcataatct ggagcctgat gtcttaacga ataaagggtcc catgctccac ccgaaaaaaaa      240
aaaaaaaaa                                     248

```

```

<210> 78
<211> 201
<212> DNA
<213> Homo sapien

```

```

<400> 78
actagtccag tgtggtggaa ttccattgtg ttgggcccac cacaatggct acctttaaca      60
tcacccagac cccgccctgc ccgtgcccac cgctgctgct aacgacagta tgatgcttac      120
tctgctactc ggaaactatt tttatgtaat taatgtatgc tttcttgttt ataatgcct      180
gatttaaaaa aaaaaaaaaa a                                     201

```

```

<210> 79
<211> 552
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1) ... (552)
<223> n = A,T,C or G

```

```

<400> 79
tccttttgtt aggtttttga gacaacccta gacctaaact gtgtcacaga cttctgaatg      60
tttaggcagt gctagtaatt tcctcgtaat gattctgtta ttactttcct attctttatt      120
cctctttcct ctgaagatta atgaagttga aaattgaggt ggataaatac aaaaaggtag      180
tgtgatagta taagtatcta agtgcagatg aaagtgtgtt atatatatcc attcaaaatt      240
atgcaagtta gtaattactc aggggttaact aaattacttt aatatgctgt tgaacctact      300
ctgttccttg gctagaaaaa attataaaca ggactttgtt agtttgggaa gccaaattga      360
taatattcta tgttctaaaa gttgggctat acataaanta tnaagaaata tgggaatttta      420
ttcccaggaa tatgggggtc atttatgaat antaccggg anagaagttt tgantnaaac      480
cngttttggt taatacgta atatgtcctn aatnaacaag gcntgactta tttccaaaaa      540
aaaaaaaaa aa                                     552

```

```

<210> 80
<211> 476
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1) ... (476)
<223> n = A,T,C or G

```

```

<400> 80
acagggattt gagatgctaa ggccccagag atcgtttgat ccaaccctct tattttcaga      60
ggggaaaatg gggcctagaa gttacagagc atctagctgg tgcgctggca cccctggcct      120
cacacagact cccgagtagc tgggactaca ggacacagc cactgaagca ggccctgttt      180
gcaattcacg ttgccacctc caacttaaac attcttcata tgtgatgtcc ttagtcacta      240
aggttaaact ttcccaccca gaaaaggcaa cttagataaa atcttagagt actttcatac      300
tcttctaagt cctcttcag cctcactttg agtcctcctt ggggggttgat aggaantntc      360

```

tcttggttt ctcaataaaa tctctatcca tctcatgttt aatttggtac gcntaaaaat 420
gctgaaaaaa ttaaaatggt ctggtttcnc tttaaaaaaa aaaaaaaaaa aaaaaa 476

<210> 81
<211> 232
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(232)
<223> n = A,T,C or G

<400> 81
tttttttttg tatgccttcn ctgtgnggtt attgttgctg ccaccctgga ggagcccagt 60
ttcttctgta tctttctttt ctgggggatc ttcctggctc tgccctcca tcccagcct 120
ctcatcccca tcttgcaact ttgctagggt tggaggcgtc ttcctggtag cccctcagag 180
actcagtcag cgggaataag tcttaggggt ggggggtgtg gcaagccggc ct 232

<210> 82
<211> 383
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(383)
<223> n = A,T,C or G

<400> 82
aggcgggagc agaagctaaa gccaaagccc aagaagagtg gcagtgccag cactggtgcc 60
agtaccagta ccaataacat gccagtgccg gtgccagcac cagtgggtggc ttcagtgtctg 120
gtgccagcct gaccgccact ctcacatttg ggctcttcgc tggccttgggt ggagctggtg 180
ccagcaccag tggcagctct ggtgcctgtg gtttctccta caagtgagat ttagatatt 240
gttaatcctg ccagtctttc tcttcaagcc aggggtgcac ctcagaaacc tactcaacac 300
agcactctng gcagccacta tcaatcaatt gaagttgaca ctctgcatta aatctatttg 360
ccatttcaaa aaaaaaaaaa aaa 383

<210> 83
<211> 494
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(494)
<223> n = A,T,C or G

<400> 83
accgaattgg gaccgctggc ttataagcga tcatgtcctc cagtattacc tcaacgagca 60
gggagatcga gtctatacgc tgaagaaatt tgaccgatg ggacaacaga cctgctcagc 120
ccatcctgct cggttctccc cagatgacaa atactctcga caccgaatca ccatcaagaa 180
acgcttcaag gtgctcatga cccagcaacc gcgcctgtc ctctgagggt ccttaaactg 240
atgtcttttc tgccacctgt taccctcgg agactccgta accaaactct tcggactgtg 300
agccctgatg cctttttgcc agccatactc tttggctcc agtctctcgt ggcgattgat 360

```
tatgcttggtg tgaggcaatc atggtggcat caccatnaa gggaacacat ttganttttt 420
tttcncatat tttaaattac naccagaata nttcagaata aatgaattga aaaactctta 480
aaaaaaaaaa aaaa 494
```

<210> 84

<211> 380

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(380)

<223> n = A,T,C or G

<400> 84

```
gctggtagcc tatggcgtgg ccacggangg gctcctgagg cacgggacag tgacttccca 60
agtatcctgc gccgcgtctt ctaccgtccc tacctgcaga tcttcgggca gattccccag 120
gaggacatgg acgtggccct catggagcac agcaactgct cgtcggagcc cggcttcttg 180
gcacaccctc ctggggccca ggccggcacc tgcgtctccc agtatgccaa ctggctggtg 240
gtgctgctcc tcgtcatctt cctgctcgtg gccaacatcc tgctggtcac ttgctcattg 300
ccatgttcag ttacacattc ggcaaagtac agggcaacag cnatctctac tgggaaggcc 360
agcgttnccg cctcatccgg 380
```

<210> 85

<211> 481

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(481)

<223> n = A,T,C or G

<400> 85

```
gagttagctc ctccacaacc ttgatgaggt cgtctgcagt ggctctctgc ttcataccgc 60
tnccatcgtc atactgtagg ttgccacca cctcctgcat cttggggcgg ctaatatcca 120
ggaaactctc aatcaagtca ccgtcnatna aacctgtggc tggttctgtc ttccgctcgg 180
tgtgaaagga tctccagaag gagtgctcga tcttccccac acttttgatg actttattga 240
gtcgattctg catgtccagc aggaggttgt accagctctc tgacagtgag gtcaccagcc 300
ctatcatgcc nttgaacgtg ccgaagaaca ccgagccttg tgtggggggg gnagtctcac 360
ccagattctg cattaccaga nagccgtggc aaaaganatt gacaactcgc ccaggngaa 420
aaagaacacc tcctggaagt gctngccgct cctcgtccnt tggtggnngc gcntnccttt 480
t 481
```

<210> 86

<211> 472

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(472)

<223> n = A,T,C or G

<400> 86

```

aacatcttcc tgtataatgc tgtgtaatat cgatccgatn ttgtctgctg agaattcatt      60
acttggaataa gcaacttnaa gcctggacac tggattataa attcacaata tgcaacactt     120
taaacagtgt gtcaatctgc tcccttactt tgtcatcacc agtctgggaa taagggtatg     180
ccctattcac acctgttaaa agggcgctaa gcatttttga ttcaacatct ttttttttga     240
cacaagtccg aaaaaagcaa aagtaaacag ttnttaattt gttagccaat tcactttctt     300
catgggacag agccatttga tttaaaaagc aaattgcata atattgagct ttgggagctg     360
atatntgagc ggaagantag cttttctact tcaccagaca caactccttt catattggga     420
tgttnacnaa agttatgtct cttacagatg ggatgctttt gtggcaattc tg              472

```

<210> 87

<211> 413

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(413)

<223> n = A,T,C or G

<400> 87

```

agaaaccagt atctctnaaa acaacctctc ataccttggtg gacctaatTT tgtgtgctg      60
tgtgtgtgct cgcatattat atagacaggc acatcttttt tacttttgta aaagcttatg     120
cctcttttgt atctatatct gtgaaagtgt taatgatctg ccataatgtc ttggggacct     180
ttgtcttctg tgtaaatggt actagagaaa acacctatnt tatgagtcaa tctagtntgt     240
tttattcgac atgaaggaaa ttccagatn acaacactna caaactctcc cttgactagg     300
ggggacaaaag aaaagcnaaa ctgaacatna gaaacaattn cctggtgaga aattncataa     360
acagaaattg ggtngtatat tgaaananng catcattnaa acgttttttt ttt              413

```

<210> 88

<211> 448

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(448)

<223> n = A,T,C or G

<400> 88

```

cgcagcgggt cctctctatc tagctccagc ctctcgctg cccactccc cgcgtcccgc      60
gtcctagccn accatggccg ggccccctgc cgccccctgc ctctgctggt ccacctggc     120
cgtggccctg gccgtgagcc ccgcggcccg ctccagtcct ggcaagccgc cgcgcctggt     180
gggaggccca tggacccccg gtggaagaag aaggtgtgct gcgtgcactg gactttgccg     240
tcggcnanta caacaaaccc gcaacnactt ttaccnagcn cgcgtgcag gttgtgccgc     300
cccaancaaa ttgttactng gggtaantaa ttcttgggaag ttgaacctgg gccaaacnng     360
tttaccagaa ccnagccaat tngaacaatt nccccctccat aacagcccct tttaaaaagg     420
gaancantcc tgntcttttc caaatTTT              448

```

<210> 89

<211> 463

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(463)

<223> n = A,T,C or G

<400> 89

| | | | | | | |
|------------|-------------|------------|------------|------------|------------|-----|
| gaattttgtg | cactggccac | tgtgatggaa | ccattgggcc | aggatgcttt | gagtttatca | 60 |
| gtagtgattc | tgccaaagtt | gggtttgtaa | catgagtatg | taaaatgtca | aaaaattagc | 120 |
| agaggtctag | gtctgcatat | cagcagacag | tttgtccgtg | tattttgtag | ccttgaagtt | 180 |
| ctcagtgaca | agttntttct | gatgôgaagt | tctnattcca | gtgttttagt | cctttgcatc | 240 |
| tttnatgttn | agacttgccct | ctntnaaatt | gcttttgtn | tctgcaggta | ctatctgtgg | 300 |
| tttaacaaaa | tagaannact | tctctgcttn | gaanatttga | atatcttaca | tctnaaaatn | 360 |
| aattctctcc | ccatannaaa | acccangccc | ttggganaat | ttgaaaaang | gntccttcnn | 420 |
| aattcnana | anttcagntn | tcatacaaca | naacngganc | ccc | | 463 |

<210> 90

<211> 400

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(400)

<223> n = A,T,C or G

<400> 90

| | | | | | | |
|-------------|------------|------------|------------|-------------|------------|-----|
| agggattgaa | ggctctntnt | actgtcggac | tgttcanca | ccaactctac | aagttgctgt | 60 |
| cttccactca | ctgtctgtaa | gcntnttaac | ccagactgta | tcttcataaa | tagaacaat | 120 |
| tcttcaccag | tcacatcttc | taggaccttt | ttggattcag | ttagtataag | ctcttccact | 180 |
| tcctttgtta | agacttcctc | tggtaaagtc | ttaggttttg | tagaaaaggaa | tttaattgct | 240 |
| cgttctctaa | caatgtcctc | tccttgaagt | atttggctga | acaaccacc | tnaagtcct | 300 |
| ttgtgcatcc | attttaaata | tacttaatag | ggcattggtn | cactagggtta | aattctgcaa | 360 |
| gagtcactctg | tctgcaaaag | ttgcgttagt | atatctycca | | | 400 |

<210> 91

<211> 480

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(480)

<223> n = A,T,C or G

<400> 91

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| gagctcggat | ccaataatct | ttgtctgagg | gcagcacaca | tatncagtgc | catggnaact | 60 |
| ggcttaccct | acatgggagc | agcatgccgt | agntatataa | ggtcattccc | tgagtcagac | 120 |
| atgcctcttt | gactaccgtg | tgccagtgtc | gggtattctc | acacacctcc | nncgcctctt | 180 |
| tgtggaaaaa | ctggcacttg | nctggaacta | gcaagacatc | acttacaaat | tcaccacga | 240 |
| gacacttgaa | aggtgtaaca | aagcgactct | tgcattgtct | tttgtccctc | cggcaccagt | 300 |
| tgtcaatact | aacctgctgg | tttgccctcca | tcacatttgt | gatctgtagc | tctggataca | 360 |
| tctcctgaca | gtactgaaga | acttcttctt | ttgtttcaaa | agcaactctt | ggtgcctgtt | 420 |
| ngatcagggt | cccatctccc | agtcggaatg | ttcacatggc | atatnttact | tcccacaaaa | 480 |

<210> 92

<211> 477

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(477)

<223> n = A,T,C or G

<400> 92

| | | | | | | |
|-------------|------------|------------|------------|-------------|-------------|-----|
| atacagccca | natcccacca | cgaagatgcg | cttggtgact | gagaacctga | tgcggctcact | 60 |
| ggtcccgcgtg | tagccccagc | gactctccac | ctgctggaag | cgggtgatgc | tgcactcctt | 120 |
| cccacgcagg | cagcagcggg | gccggtcaat | gaactccact | cgtggccttg | ggttgacggg | 180 |
| taantgcagg | aagaggctga | ccacctcgcg | gtccaccagg | atgcccgaact | gtgcgggacc | 240 |
| tgcagcgaaa | ctcctcgatg | gtcatgagcg | ggaagcgaat | gangcccagg | gccttgccca | 300 |
| gaaccttccg | cctgttctct | ggcgtcacct | gcagctgctg | ccgctnacac | tcggcctcgg | 360 |
| accagcggac | aaacggcggt | gaacagccgc | acctcacgga | tgcccantgt | gtcgcgctcc | 420 |
| aggaacggcn | ccagcgtgtc | caggtcaatg | tcggtgaanc | ctccgcgggt | aatggcg | 477 |

<210> 93

<211> 377

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(377)

<223> n = A,T,C or G

<400> 93

| | | | | | | |
|------------|------------|------------|-------------|-------------|-------------|-----|
| gaacggctgg | accttgctc | gcattgtgct | gctggcagga | ataccttggc | aagcagctcc | 60 |
| agtccgagca | gccccagacc | gctgccgccc | gaagctaagc | ctgcctctgg | ccttccccctc | 120 |
| cgcctcaatg | cagaaccant | agtgggagca | ctgtgtttag | agttaagagt | gaacactgtn | 180 |
| tgattttact | tgggaatttc | ctctgttata | tagcttttcc | caatgctaata | ttccaaacaa | 240 |
| caacaacaaa | ataacatggt | tgcctgttna | gttggtataaa | agtangtgat | tctgtatnta | 300 |
| aagaaaatat | tactgttaca | tatactgctt | gcaanttctg | tattttattgg | tnctctggaa | 360 |
| ataaatatat | tattaaa | | | | | 377 |

<210> 94

<211> 495

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(495)

<223> n = A,T,C or G

<400> 94

| | | | | | | |
|-------------|------------|------------|------------|------------|------------|-----|
| ccctttgagg | ggttagggtc | cagttcccag | tggaagaaac | aggccaggag | aantgcgtgc | 60 |
| cgagctgang | cagatttccc | acagtgaccc | cagagccctg | ggctatagtc | tctgacctct | 120 |
| ccaaggaaaag | accaccttct | ggggacatgg | gctggagggc | aggacctaga | ggcaccaagg | 180 |
| gaaggcccca | ttccggggct | gttccccgag | gaggaaggga | aggggctctg | tgtgcccccc | 240 |
| acgaggaana | ggccctgant | cctgggatca | nacacccctt | cacgtgtatc | cccacacaaa | 300 |
| tgcaagctca | ccaaggtccc | ctctcagtec | cttccctaca | ccctgaacgg | ncactggccc | 360 |
| acacccaccc | agancancca | cccgccatgg | ggaatgtntc | caaggaatcg | cngggcaacg | 420 |
| tggactctng | tcccnaagg | gggcagaatc | tccaatagan | gganngaacc | cttgctnana | 480 |

aaaaaaaaana aaaaaa

495

<210> 95
 <211> 472
 <212> DNA
 <213> Homo sapien

 <220>
 <221> misc_feature
 <222> (1)...(472)
 <223> n = A,T,C or G

<400> 95
 gggtacttgg tttcattgcc accacttagt ggatgtcatt tagaaccatt ttgtctgctc 60
 cctctggaag ccttgcgag agcggacttt gtaattggtg gagaataact gctgaatttt 120
 tagctgtttt gagttgattc gcaccactgc accacaactc aatatgaaaa ctatttnact 180
 tatttattat cttgtgaaaa gtatacaatg aaaattttgt tcatactgta tttatcaagt 240
 atgatgaaaa gcaatagata tatattcttt tattatgtnn aattatgatt gccattatta 300
 atcggaacaaa tgtggagtgt atgttctttt cacagtaata tatgcctttt gtaacttcac 360
 ttgggtattt tattgtaaat gaattacaaa attcttaatt taagaaaatg gtangttata 420
 ttantttcan taatttcttt ccttgtttac gtaattttg aaaagaatgc at 472

<210> 96
 <211> 476
 <212> DNA
 <213> Homo sapien

 <220>
 <221> misc_feature
 <222> (1)...(476)
 <223> n = A,T,C or G

<400> 96
 ctgaagcatt tcttcaaact tntctacttt tgtcattgat acctgtagta agttgacaat 60
 gtgggtgaaat ttcaaaatta tatgtaactt ctactagttt tactttctcc cccaagtctt 120
 ttttaactca tgatttttac acacacaatc cagaacttat tatatagcct ctaagtcttt 180
 attcttcaca gtagatgatg aaagagtcct ccagtgtcct gngcanaatg ttctagntat 240
 agctggatac atacngtggg agttctataa actcatacct cagtgggact naaccaaaat 300
 tgtgttagtc tcaattccta ccacactgag ggagcctccc aaatcactat attcttatct 360
 gcaggtactc ctccagaaaa acngacaggg caggcttgca tgaaaaagtn acatctgcgt 420
 taaaaagtct atcttctcta nangtctgtn aaggaacaat ttaatcttct agcttt 476

<210> 97
 <211> 479
 <212> DNA
 <213> Homo sapien

 <220>
 <221> misc_feature
 <222> (1)...(479)
 <223> n = A,T,C or G

<400> 97
 actctttcta atgctgatat gatcttgagt ataagaatgc atatgtcact agaatggata 60
 aaataatgct gcaaacttaa tgttcttatg caaatggaa cgctaataa acacagctta 120

| | | | | | | |
|------------|-------------|-------------|------------|------------|------------|-----|
| caatcgcaaa | tcaaaaactca | caagtgtctca | tctgtttag | atttagtgta | ataagactta | 180 |
| gattgtgtc | cttcggatat | gattgtttct | canatcttg | gcaatnttcc | ttagtcaa | 240 |
| caggctacta | gaattctgtt | attggatatn | tgagagcatg | aaatttttaa | naatacactt | 300 |
| gtgattatna | aattaatcac | aaatttccact | tatacctgct | atcagcagct | agaaaaacat | 360 |
| ntnnttttta | natcaaagta | ttttgtgttt | ggaantgttn | aaatgaaatc | tgaatgtggg | 420 |
| ttcnatctta | ttttttcccn | gacnactant | tnctttttta | gggnctattc | tganccatc | 479 |

<210> 98

<211> 461

<212> DNA

<213> Homo sapien

<400> 98

| | | | | | | |
|------------|-------------|------------|-------------|------------|------------|-----|
| agtgacttgt | cctccaacaa | aaccccttga | tcaagtttgt | ggcactgaca | atcagaccta | 60 |
| tgctagtcc | tgatcatctat | tcgctactaa | atgcagactg | gaggggacca | aaaaggggca | 120 |
| tcaactccag | ctggattatt | ttggagcctg | caaactctatt | cctacttgta | cggactttga | 180 |
| agtgattcag | tttcctctac | ggatgagaga | ctggctcaag | aatatcctca | tcagacttta | 240 |
| tgaagccact | ctgaacacgc | tggttatcta | gatgagaaca | gagaaataaa | gtcagaaaat | 300 |
| ttacctggag | aaaagaggct | ttggctgggg | accatcccat | tgaaccttct | cttaaggact | 360 |
| ttaagaaaaa | ctaccacatg | ttgtgtatcc | tggtgccggc | cgtttatgaa | ctgaccaccc | 420 |
| tttggaataa | tcttgacgct | cctgaacttg | ctcctctgcg | a | | 461 |

<210> 99

<211> 171

<212> DNA

<213> Homo sapien

<400> 99

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| gtggccgcgc | gcaggtgttt | cctcgtaccg | cagggccccc | tccttcccc | aggcgtccct | 60 |
| cggcgccctc | gcggggccga | ggaggagcgg | ctggcggtg | gggggagtg | gaccacccct | 120 |
| cggtgagaaa | agccttctct | agcgatctga | gaggcgtgcc | ttgggggtac | c | 171 |

<210> 100

<211> 269

<212> DNA

<213> Homo sapien

<400> 100

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| cgcccgcaag | tgcaactcca | gctggggccg | tgccgacgaa | gattctgcca | gcagttggtc | 60 |
| cgactgcgac | gacggcgccg | gcgacagtcg | caggtgcagc | gcgggcgcct | ggggtcttgc | 120 |
| aaggctgagc | tgacgccgca | gaggtcgtgt | cacgtcccac | gaccttgacg | ccgtcgggga | 180 |
| cagccggaac | agagcccgg | gaagcgggag | gcctcgggga | gcccctcggg | aaggcgggcc | 240 |
| cgagagatac | gcaggtgcag | gtggccgcc | | | | 269 |

<210> 101

<211> 405

<212> DNA

<213> Homo sapien

<400> 101

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| tttttttttt | ttttggaatc | tactgcgagc | acagcaggtc | agcaacaagt | ttattttgca | 60 |
| gctagcaagg | taacagggtg | gggcatggtt | acatgttcag | gtcaacttcc | tttgtcgtgg | 120 |
| ttgattggtt | tgtctttatg | ggggcggggt | ggggtagggg | aaacgaagca | aataacatgg | 180 |
| agtgggtgca | ccctccctgt | agaacctggt | tacaaagctt | ggggcagttc | acctggtctg | 240 |
| tgaccgtcat | tttcttgaca | tcaatgttat | tagaagtcag | gatatctttt | agagagtcca | 300 |

ctgttctgga gggagattag ggtttcttgc caaatccaac aaaatccact gaaaaagttg 360
 gatgatcagt acgaataccg aggcatattc tcatatcggg ggcca 405

<210> 102
 <211> 470
 <212> DNA
 <213> Homo sapien

<400> 102
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 tcaaaatcta aattatttcaa attagccaaa tccttaccaa ataataccca aaaatcaaaa 180
 atatacttct ttcagcaaac ttgttacata aattaaaaaa atatatacgg ctgggtgtttt 240
 caaagtacaa ttatcttaac actgcaaaca ttttaaggaa ctaaaataaa aaaaaacact 300
 ccgcaaagggt taaagggaac aacaaattct ttacaacac cattataaaa atcatatctc 360
 aaatcttagg ggaatatata cttcacacgg gatcttaact ttactcact ttgtttattt 420
 ttttaaacca ttgtttgggc ccaacacaat ggaatcccc ctggactagt 470

<210> 103
 <211> 581
 <212> DNA
 <213> Homo sapien

<400> 103
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 taaatggaaa ctgccttaga tacataattc ttaggaatta gcttaaaatc tgcctaaagt 180
 gaaaatcttc tctagctctt ttgactgtaa atttttgact cttgtaaaac atccaaattc 240
 atttttcttg tctttaaaat tatctaattc ttccattttt tccctattcc aagtcaattt 300
 gcttctctag cctcatttcc tagctcttat ctactattag taagtggctt ttttcctaaa 360
 agggaaaaca ggaagagaaa tggcacacaa aacaaacatt ttatattcat atttctacct 420
 acgttaataa aatagcattt tgtgaagcca gctcaaaaga aggcttagat ccttttatgt 480
 ccatttttagt cactaaacga tatcaaagtg ccagaatgca aaagggttgt gaacatttat 540
 tcaaaagcta atataagata tttcacatac tcatctttct g 581

<210> 104
 <211> 578
 <212> DNA
 <213> Homo sapien

<400> 104
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 ctcttatgct atatcatatt ttaagttaaa ctaatgagtc actggcttat cttctcctga 180
 aggaaatctg ttcattcttc tcattcatat agttatatca agtactacct tgcattattga 240
 gaggtttttt ttctctattt acacatatat ttccatgtga atttgatatca aacctttatt 300
 ttcattgcaa ctagaaaata atgtttcttt tgcataagag aagagaacaa tatagcatta 360
 caaaactgct caaattgttt gttaagttat ccattataat tagttggcag gagctaatac 420
 aaatcacatt tacgacagca ataataaac tgaagtacca gttaaatata caaaataatt 480
 aaaggaacat ttttagcctg ggtataatta gctaattcac tttacaagca tttattagaa 540
 tgaattcaca tgttattatt cctagcccaa cacaatgg 578

<210> 105
 <211> 538
 <212> DNA

<213> Homo sapien

<400> 105

| | | | | | | |
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| gaaaagtgcc | ttacatttaa | taaaagtttg | tttctcaaag | tgatcagagg | aattagatat | 120 |
| gtcttgaaca | ccaatattaa | tttgaggaaa | atacaccaaa | atacattaag | taaattattt | 180 |
| aagatcatag | agcttgtaag | tgaaaagata | aaatttgacc | tcagaaactc | tgagcattaa | 240 |
| aatccacta | ttagcaaata | aattactatg | gacttcttgc | tttaattttg | tgatgaatat | 300 |
| ggggtgtcac | tggtaaacca | acacattctg | aaggatacat | tacttagtga | tagattctta | 360 |
| tgtactttgc | taatacgtgg | atatgagttg | acaagtttct | ctttcttcaa | tcttttaagg | 420 |
| ggcgagaaat | gaggaagaaa | agaaaaggat | tacgcatact | gttctttcta | tggaaggatt | 480 |
| agatatgttt | cctttgccaa | tattaaaaaa | ataataatgt | ttactactag | tgaaaccc | 538 |

<210> 106

<211> 473

<212> DNA

<213> Homo sapien

<400> 106

| | | | | | | |
|------------|-------------|------------|------------|-------------|------------|-----|
| tttttttttt | tttttttagtc | aagtttctat | ttttattata | attaaagtct | tggtcatttc | 60 |
| atttattagc | tctgcaactt | acatatttaa | attaaagaaa | cgtttttagac | aactgtacaa | 120 |
| tttataaatg | taagggtgcca | ttattgagta | atatattcct | ccaagagtgg | atgtgtccct | 180 |
| tctcccacca | actaatgaac | agcaacatta | gtttaatttt | attagtagat | atacactgct | 240 |
| gcaaacgcta | attctcttct | ccatcccat | gtgatattgt | gtatatgtgt | gagttggtag | 300 |
| aatgcatac | aatctacaat | caacagcaag | atgaagctag | gctgggcttt | cggtgaaaat | 360 |
| agactgtgtc | tgtctgaatc | aaatgatctg | acctatcctc | ggtggcaaga | actcttcgaa | 420 |
| ccgcttcttc | aaaggcgctg | ccacatttgt | ggctctttgc | acttgtttca | aaa | 473 |

<210> 107

<211> 1621

<212> DNA

<213> Homo sapien

<400> 107

| | | | | | | |
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| cgccattggca | ctgcagggca | tctcggtcat | ggagctgtcc | ggcctggccc | cgggcccgtt | 60 |
| ctgtgctatg | gtcctggctg | acttcggggc | cgctgtggta | cgctgggacc | ggcccggctc | 120 |
| ccgctacgac | gtgagccgct | tgggcccggg | caagcgctcg | ctagtgtctg | acctgaagca | 180 |
| gccgcgggga | gccgcgctgc | tgcggcgctc | gtgcaagcgg | tcggatgtgc | tgctggagcc | 240 |
| cttcgccgcg | ggtgtcatgg | agaaactcca | gctgggccc | gagattctgc | agcgggaaaa | 300 |
| tccaaggctt | atttatgcca | ggctgagtg | atttggccag | tcagggaagc | tctgccggtt | 360 |
| agctggccac | gatatcaact | atttggtttt | gtcaggtgtt | ctctcaaaaa | ttggcagaag | 420 |
| tggtgagaat | ccgtatgccc | cgctgaatct | cctggctgac | tttgctggtg | gtggccttat | 480 |
| gtgtgactg | ggcattataa | tggctctttt | tgaccgcaca | cgactgaca | agggtcaggt | 540 |
| cattgatgca | aatatggtgg | aaggaacagc | atatttaagt | tcttttctgt | ggaaaactca | 600 |
| gaaatcgagt | ctgtgggaag | cacctcgagg | acagaacatg | ttggatggtg | gagcaccttt | 660 |
| ctatacgact | tacaggacag | cagatgggga | attcatggct | gttggagcaa | tagaacccca | 720 |
| gttctacgag | ctgctgatca | aaggacttgg | actaaagtct | gatgaacttc | ccaatcagat | 780 |
| gagcatggat | gattggccag | aaatgaagaa | gaagtttgca | gatgtatttg | caaagaagac | 840 |
| gaaggcagag | tgggtgtcaa | tctttgacgg | cacagatgcc | tgtgtgactc | cggttctgac | 900 |
| ttttgaggag | gttggttcac | atgatcacia | caaggaacgg | ggctcgttta | tcaccagtga | 960 |
| ggagcaggac | gtgagccccc | gccctgcacc | tctgctgtta | aacaccccag | ccatcccttc | 1020 |
| tttcaaaagg | gaccttttca | taggagaaca | cactgaggag | atacttgaag | aatttggatt | 1080 |
| cagccgcgaa | gagatttatc | agcttaactc | agataaaatc | attgaaagta | ataaggtaaa | 1140 |
| agctagtctc | taacttccag | gccacggct | caagtgaatt | tgaatactgc | atttacagtg | 1200 |
| tagagtaaca | cataacattg | tatgcatgga | aacatggagg | aacagtatta | cagtgtccta | 1260 |

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ccactctaatt caagaaaaga attacagact ctgattctac agtgatgatt gaattctaaa 1320
aatgggtatc attagggctt ttgatttata aaactttggg tacttatact aaattatggt 1380
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atttacactc ttgattctac aatgtagaaa atgaggaaat gccacaaatt gtatggtgat 1560
aaaagtcacg tgaacaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1620
a 1621

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<210> 108

<211> 382

<212> PRT

<213> Homo sapien

<400> 108

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Gly Pro Phe Cys Ala Met Val Leu Ala Asp Phe Gly Ala Arg Val Val
20 25 30
Arg Val Asp Arg Pro Gly Ser Arg Tyr Asp Val Ser Arg Leu Gly Arg
35 40 45
Gly Lys Arg Ser Leu Val Leu Asp Leu Lys Gln Pro Arg Gly Ala Ala
50 55 60
Val Leu Arg Arg Leu Cys Lys Arg Ser Asp Val Leu Leu Glu Pro Phe
65 70 75 80
Arg Arg Gly Val Met Glu Lys Leu Gln Leu Gly Pro Glu Ile Leu Gln
85 90 95
Arg Glu Asn Pro Arg Leu Ile Tyr Ala Arg Leu Ser Gly Phe Gly Gln
100 105 110
Ser Gly Ser Phe Cys Arg Leu Ala Gly His Asp Ile Asn Tyr Leu Ala
115 120 125
Leu Ser Gly Val Leu Ser Lys Ile Gly Arg Ser Gly Glu Asn Pro Tyr
130 135 140
Ala Pro Leu Asn Leu Leu Ala Asp Phe Ala Gly Gly Gly Leu Met Cys
145 150 155 160
Ala Leu Gly Ile Ile Met Ala Leu Phe Asp Arg Thr Arg Thr Asp Lys
165 170 175
Gly Gln Val Ile Asp Ala Asn Met Val Glu Gly Thr Ala Tyr Leu Ser
180 185 190
Ser Phe Leu Trp Lys Thr Gln Lys Ser Ser Leu Trp Glu Ala Pro Arg
195 200 205
Gly Gln Asn Met Leu Asp Gly Gly Ala Pro Phe Tyr Thr Thr Tyr Arg
210 215 220
Thr Ala Asp Gly Glu Phe Met Ala Val Gly Ala Ile Glu Pro Gln Phe
225 230 235 240
Tyr Glu Leu Leu Ile Lys Gly Leu Gly Leu Lys Ser Asp Glu Leu Pro
245 250 255
Asn Gln Met Ser Met Asp Asp Trp Pro Glu Met Lys Lys Lys Phe Ala
260 265 270
Asp Val Phe Ala Lys Lys Thr Lys Ala Glu Trp Cys Gln Ile Phe Asp
275 280 285
Gly Thr Asp Ala Cys Val Thr Pro Val Leu Thr Phe Glu Glu Val Val
290 295 300
His His Asp His Asn Lys Glu Arg Gly Ser Phe Ile Thr Ser Glu Glu
305 310 315 320
Gln Asp Val Ser Pro Arg Pro Ala Pro Leu Leu Leu Asn Thr Pro Ala

```

| | | | | | |
|---|-----|-----|-----|-----|-----|
| | 325 | | 330 | | 335 |
| Ile Pro Ser Phe Lys Arg Asp Pro Phe Ile Gly Glu His Thr Glu Glu | | | | | |
| | 340 | | 345 | | 350 |
| Ile Leu Glu Glu Phe Gly Phe Ser Arg Glu Glu Ile Tyr Gln Leu Asn | | | | | |
| | 355 | | 360 | | 365 |
| Ser Asp Lys Ile Ile Glu Ser Asn Lys Val Lys Ala Ser Leu | | | | | |
| 370 | | 375 | | 380 | |

<210> 109
 <211> 1524
 <212> DNA
 <213> Homo sapien

<400> 109

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| gggcctggcc | atgcctcact | gagccagcgc | ctgcgcctct | acctcgccga | cagctggaac | 120 |
| cagtgcgacc | tagtggctct | cacctgcttc | ctcctgggcg | tgggctgccc | gctgaccccc | 180 |
| ggtttgtacc | acctgggccc | cactgtcctc | tgcctcgact | tcattggttt | cacgggtgccc | 240 |
| ctgcttcaca | tcttcacggt | caacaaacag | ctggggccca | agatcgctcat | cgtgagcaag | 300 |
| atgatgaagg | acgtgttctt | cttctctctc | ttcctcgggc | tgtggctggt | agcctatggc | 360 |
| gtggccacgg | aggggctcct | gaggccacgg | gacagtgact | tcccaagtat | cctgcccgcg | 420 |
| gtcttctacc | gtccctacct | gcagatcttc | gggcagattc | cccaggagga | catggacgtg | 480 |
| gcccctcatg | agcacagcaa | ctgctcgctc | gagcccggct | tctgggcaca | ccctcctggg | 540 |
| gcccaggcgg | gcacctgctg | ctcccagtat | gccaaactgg | tgggtgggtg | gctcctcgct | 600 |
| atcttcctgc | tcgtggccaa | catectgctg | gtcaacttgc | tcattgccat | gttcagttac | 660 |
| acattcggca | aagtacaggc | caacagcgat | ctctactgga | aggcgcagcg | ttaccgcctc | 720 |
| atccgggaat | tccactctcg | gcccgcgctg | gcccggagcc | ttatcgctcat | ctcccacttg | 780 |
| cgctcctgct | tcaggcaatt | gtgcaggcga | ccccggagcc | cccagccgct | ctccccggcc | 840 |
| ctcgagcatt | tccgggttta | ccttttctaag | gaagccgagc | ggaagctgct | aaagtgggaa | 900 |
| tcggtgcata | aggagaactt | tctgctggca | cgcgctaggg | acaagcggga | gagcgactcc | 960 |
| gagcgtctga | agcgcacgct | ccagaagggt | gacttggcac | tgaacacagc | gggacacatc | 1020 |
| cgcgagtacg | aacagcgcc | gaaagtgtg | gagcgggagg | tccagcagtg | tagccgcgct | 1080 |
| ctgggggtgg | tggccgaggg | cctgagccgc | tctgccttgc | tgcccccagg | tgggcccggc | 1140 |
| ccccctgacc | tgcttgggtc | caaagactga | gcctgctggt | cggacttcaa | ggagaagccc | 1200 |
| ccacagggga | ttttgtcct | agagtaaggc | tcctctgggc | ctcggccccc | gcacctgggt | 1260 |
| gccttgtcct | tgaggtgagc | cccatgtcca | tctggggcac | tgctaggacc | acctttggga | 1320 |
| gtgtcatcct | tacaaaccac | agcatgcccc | gctcctccca | gaaccagtcc | cagcctggga | 1380 |
| ggatcaaggc | ctggatcccc | ggccgttacc | catctggagg | ctgcagggtc | cttggggtaa | 1440 |
| cagggaccac | agacccctca | ccactcacag | attcctcaca | ctggggaaat | aaagccattt | 1500 |
| cagaggaaaa | aaaaaaaaaa | aaaa | | | | 1524 |

<210> 110
 <211> 3410
 <212> DNA
 <213> Homo sapien

<400> 110

| | | | | | | |
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| gtgatgagac | gtgtccccac | tgaggtgccc | cacagcagca | ggtgttgagc | atgggctgag | 120 |
| aagctggacc | ggcaccaaa | ggctggcaga | aatgggcgcc | tggctgattc | ctaggcagtt | 180 |
| ggcggcagca | aggaggagag | gccgcagctt | ctggagcaga | gccgagacga | agcagttctg | 240 |
| gagtgcctga | acggccccct | gagccctacc | cgcttggccc | actatgggtc | agaggctgtg | 300 |
| ggtgagccgc | ctgctgcggc | accggaaagc | ccagctcttg | ctgggtcaacc | tgctaacctt | 360 |
| tggcctggag | gtgtgttttg | ccgcaggcat | cacctatgtg | ccgcctctgc | tgctggaagt | 420 |
| gggggtagag | gagaagttca | tgaccatggt | gctgggcatt | ggtccagtcg | tgggcctggt | 480 |

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|------|
| ctgtgtcccg | ctcctaggct | cagccagtga | ccactggcgt | ggacgctatg | gccgcgcg | 540 |
| gcccttcac | tgggcaactgt | ccttgggcat | cctgctgagc | ctctttctca | tcccaagggc | 600 |
| cggctggcta | gcagggctgc | tgtgcccga | tcccaggccc | ctggagctgg | caactgctcat | 660 |
| cctgggctg | gggctgctgg | acttctgtgg | ccaggtgtgc | ttcactccac | tggaggccct | 720 |
| gctctctgac | ctcttccggg | acccgacca | ctgtcgccag | gcctactctg | tctatgcctt | 780 |
| catgatcagt | cttgggggct | gcctgggcta | cctcctgcct | gccattgact | gggacaccag | 840 |
| tgccctggcc | ccctacctgg | gcacccagga | ggagtgcctc | tttggcctgc | tcaccctcat | 900 |
| cttcttcacc | tgcgtagcag | ccacactgct | ggtggctgag | gaggcagcgc | tgggccccac | 960 |
| cgagccagca | gaagggctgt | cggccccctc | cttgtcgccc | caactgctgtc | catgccgggc | 1020 |
| ccgcttggt | ttccggaacc | tgggcgcctc | gcttccccgg | ctgcaccagc | tgtgctgccg | 1080 |
| catgccccgc | accctgcgcc | ggctcttcgt | ggctgagctg | tgcagctgga | tggcactcat | 1140 |
| gaccttcacg | ctgttttaca | cggatttcgt | ggcgagggg | ctgtaccagg | gcgtgcccag | 1200 |
| agctgagccg | ggcaccgagg | cccggagaca | ctatgatgaa | ggcgttcgga | tgggcagcct | 1260 |
| ggggctgttc | ctgcagtgcg | ccatctccct | ggtcttctct | ctggtcattg | accggctggt | 1320 |
| gcagcgattc | ggcactcgag | cagtctatct | ggccagtgtg | gcagctttcc | ctgtggctgc | 1380 |
| cggtgccaca | tgcctgtccc | acagtgtggc | cgtggtgaca | gcttcagccg | ccctcaccgg | 1440 |
| gttcaccttc | tcagccctgc | agatcctgcc | ctacacactg | gcctccctct | accaccggga | 1500 |
| gaagcaggtg | ttcctgcccc | aataccgagg | ggacactgga | ggtgctagca | gtgaggacag | 1560 |
| cctgatgacc | agcttctctg | caggccctaa | gcctggagct | cccttcccta | atggacacgt | 1620 |
| gggtgctgga | ggcagtggcc | tgtctccacc | tccacccgcg | ctctgcgggg | cctctgcctg | 1680 |
| tgatgtctcc | gtacgtgtgg | tgggtgggtga | gcccaccgag | gccagggtgg | ttccgggccg | 1740 |
| gggcatctgc | ctggacctcg | ccatcctgga | tagtgccctc | ctgctgtccc | aggtggcccc | 1800 |
| atccctgttt | atgggctcca | ttgtccagct | cagccagtct | gtcactgcct | atatggtgtc | 1860 |
| tggcgcaggc | ctgggtcttg | tcgccattta | ctttgtctaca | caggtagtat | ttgacaaga | 1920 |
| cgacttgccc | aaatactcag | cgtagaaaac | ttccagcaca | ttgggggtgga | gggcctgcct | 1980 |
| cactgggtcc | cagctccccg | ctcctgttag | ccccatgggg | ctgcggggct | ggccgccagt | 2040 |
| ttctgttgc | gccaaagtaa | tgtggctctc | tgtctgccac | ctgtgctgct | gaggtgcgta | 2100 |
| gctgcacagc | tgggggctgg | ggcgtccctc | tcctctctcc | ccagtctcta | gggtgccc | 2160 |
| actggaggcc | ttccaagggg | gtttcagctc | ggacttatac | agcgaggcca | gaagggtccc | 2220 |
| atgcactgga | atgcggggac | tctgcaggtg | gattaccacg | gctcagggtt | aacagctagc | 2280 |
| ctcctagtgt | agacacacct | agagaagggt | ttttgggagc | tgaataaact | cagtcaactg | 2340 |
| gtttcccatc | tctaagcccc | ttaacctgca | gcttcgttta | atgtagctct | tgcattgggag | 2400 |
| ttcttaggat | gaaacactcc | tccatgggat | ttgaacatat | gacttatattg | taggggaaga | 2460 |
| gtcctgaggg | gcaacacaca | agaaccaggt | cccctcagcc | cacagcactg | tctttttgct | 2520 |
| gatccacccc | cctcttacct | tttatcagga | tgtggcctgt | tggtccttct | gttgccatca | 2580 |
| cagagacaca | ggcattttaa | tatttaactt | atttatttta | caaagtagaa | gggaatccat | 2640 |
| tgtagctttt | tctgtgttgg | tgtctaatat | ttgggtaggg | tgggggatcc | ccaacaatca | 2700 |
| ggccccctga | gatagctggt | cattgggctg | atcattgcca | gaatcttctt | ctcctggggg | 2760 |
| ctggcccccc | aaaatgccta | accagggacc | ttggaaattc | tactcatccc | aaatgataat | 2820 |
| tccaaatgct | gttaccceaag | gttaggggtg | tgaaggagg | tagagggtgg | ggcttcagg | 2880 |
| ctcaacggct | tccctaacca | cccctcttct | cttggcccag | cctgggtccc | cccacttcca | 2940 |
| ctccccctca | ctctctctag | gactgggctg | atgaaggcac | tgccccaaat | ttccccctacc | 3000 |
| cccaactttc | ccctaccccc | aactttcccc | accagctcca | caaccctgtt | tggagctact | 3060 |
| gcaggaccag | aagcacaaaag | tgcggtttcc | caagcctttg | tccatctcag | ccccagagt | 3120 |
| atatctgtgc | ttggggaatc | tcacacagaa | actcaggagc | acccctgcc | tgagctaagg | 3180 |
| gaggtcttat | ctctcagggg | gggtttaagt | gccgtttgca | ataatgtcgt | cttattttatt | 3240 |
| tagcgggggtg | aatattttat | actgtaagt | agcaatcaga | gtataatgtt | tatgggtgaca | 3300 |
| aaattaaagg | ctttcttata | tgtttaaaaa | aaaaaaaaaa | aaaaaaaaaa | aaaaaaaaaa | 3360 |
| aaaaaaaaara | aaaaaaaaaa | aaaaaaaaaa | aaaaaaataa | aaaaaaaaaa | | 3410 |

<210> 111

<211> 1289

<212> DNA

<213> Homo sapien

<400> 111

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agccaggcgt ccctctgcct gccactcag tggcaacacc cgggagctgt tttgtccttt 60
gtggagcctc agcagttccc tctttcagaa ctactgcca agagccctga acaggagcca 120
ccatgcagtg cttcagcttc attaagacca tgatgatcct cttcaatttg ctcactcttc 180
tgtgtggtgc agccctggtg gcagtgggca tctgggtgtc aatcgatggg gcaccccttc 240
tgaagatctt cgggccactg tcgtccagtg ccatgcagtt tgtcaacgtg ggctacttcc 300
tcacgcagc cggcggtgtg gtctttgtct ttggtttcct gggctgctat ggtgctaaga 360
ctgagagcaa gtgtgccctc gtgacgttct tcttcaccc cctcctcctc ttcattgctg 420
aggttgcagc tgctgtggtc gccttgggtg acaccacaat ggctgagcac ttcctgacgt 480
tgctggtagt gcctgccatc aagaaagatt atggttccca ggaagacttc actcaagtgt 540
ggaacaccac catgaaaggg ctcaagtgtg gtggcttcac caactatacg gatattgagg 600
actcacccta cttcaaagag aacagtgcct ttccccatt ctgttgcaat gacaacgtca 660
ccaacacagc caatgaaacc tgcaccaagc aaaaggctca cgaccaaaaa gtagagggtt 720
gcttcaatca gcttttgtat gacatccgaa ctaatgcagt caccgtgggt ggtgtggcag 780
ctggaattgg gggcctcgag ctggctgcca tgattgtgtc catgtatctg tactgcaatc 840
tacaataagt ccacttctgc ctctgccact actgctgcca catgggaact gtgaagaggc 900
accctggcaa gcagcagtgat ttgggggagg ggacaggatc taacaatgtc acttgggcca 960
gaatggacct gccctttctg ctccagactt ggggctagat agggaccact ccttttagcg 1020
atgcctgact ttccttccat tgggtgggtg atgggtgggg ggcattccag agcctctaag 1080
gtagccagtt ctggtgcccc ttccccagt ctattaaacc cttgatatgc cccctagggc 1140
tagtggtagt cccagtgtc tactggggga tgagagaaag gcattttata gcctgggcat 1200
aagtgaatc agcagagcct ctgggtggat gtgtagaagg cacttcaaaa tgcataaacc 1260
tggtacaatg ttaaaaaaaaa aaaaaaaaaa 1289

```

<210> 112

<211> 315

<212> PRT

<213> Homo sapien

<400> 112

```

Met Val Phe Thr Val Arg Leu Leu His Ile Phe Thr Val Asn Lys Gln
1          5          10          15
Leu Gly Pro Lys Ile Val Ile Val Ser Lys Met Met Lys Asp Val Phe
20          25          30
Phe Phe Leu Phe Phe Leu Gly Val Trp Leu Val Ala Tyr Gly Val Ala
35          40          45
Thr Glu Gly Leu Leu Arg Pro Arg Asp Ser Asp Phe Pro Ser Ile Leu
50          55          60
Arg Arg Val Phe Tyr Arg Pro Tyr Leu Gln Ile Phe Gly Gln Ile Pro
65          70          75          80
Gln Glu Asp Met Asp Val Ala Leu Met Glu His Ser Asn Cys Ser Ser
85          90          95
Glu Pro Gly Phe Trp Ala His Pro Pro Gly Ala Gln Ala Gly Thr Cys
100         105         110
Val Ser Gln Tyr Ala Asn Trp Leu Val Val Leu Leu Leu Val Ile Phe
115         120         125
Leu Leu Val Ala Asn Ile Leu Leu Val Asn Leu Leu Ile Ala Met Phe
130         135         140
Ser Tyr Thr Phe Gly Lys Val Gln Gly Asn Ser Asp Leu Tyr Trp Lys
145         150         155         160
Ala Gln Arg Tyr Arg Leu Ile Arg Glu Phe His Ser Arg Pro Ala Leu
165         170         175
Ala Pro Pro Phe Ile Val Ile Ser His Leu Arg Leu Leu Leu Arg Gln
180         185         190
Leu Cys Arg Arg Pro Arg Ser Pro Gln Pro Ser Ser Pro Ala Leu Glu

```

| | | |
|---|-----|-----|
| 195 | 200 | 205 |
| His Phe Arg Val Tyr Leu Ser Lys Glu Ala Glu Arg Lys Leu Leu Thr | | |
| 210 | 215 | 220 |
| Trp Glu Ser Val His Lys Glu Asn Phe Leu Leu Ala Arg Ala Arg Asp | | |
| 225 | 230 | 235 |
| Lys Arg Glu Ser Asp Ser Glu Arg Leu Lys Arg Thr Ser Gln Lys Val | | |
| 245 | 250 | 255 |
| Asp Leu Ala Leu Lys Gln Leu Gly His Ile Arg Glu Tyr Glu Gln Arg | | |
| 260 | 265 | 270 |
| Leu Lys Val Leu Glu Arg Glu Val Gln Gln Cys Ser Arg Val Leu Gly | | |
| 275 | 280 | 285 |
| Trp Val Ala Glu Ala Leu Ser Arg Ser Ala Leu Leu Pro Pro Gly Gly | | |
| 290 | 295 | 300 |
| Pro Pro Pro Pro Asp Leu Pro Gly Ser Lys Asp | | |
| 305 | 310 | 315 |

<210> 113

<211> 553

<212> PRT

<213> Homo sapien

<400> 113

| | | |
|---|-----|-----|
| Met Val Gln Arg Leu Trp Val Ser Arg Leu Leu Arg His Arg Lys Ala | | |
| 1 | 5 | 10 |
| Gln Leu Leu Leu Val Asn Leu Leu Thr Phe Gly Leu Glu Val Cys Leu | | |
| 20 | 25 | 30 |
| Ala Ala Gly Ile Thr Tyr Val Pro Pro Leu Leu Leu Glu Val Gly Val | | |
| 35 | 40 | 45 |
| Glu Glu Lys Phe Met Thr Met Val Leu Gly Ile Gly Pro Val Leu Gly | | |
| 50 | 55 | 60 |
| Leu Val Cys Val Pro Leu Leu Gly Ser Ala Ser Asp His Trp Arg Gly | | |
| 65 | 70 | 75 |
| Arg Tyr Gly Arg Arg Arg Pro Phe Ile Trp Ala Leu Ser Leu Gly Ile | | |
| 85 | 90 | 95 |
| Leu Leu Ser Leu Phe Leu Ile Pro Arg Ala Gly Trp Leu Ala Gly Leu | | |
| 100 | 105 | 110 |
| Leu Cys Pro Asp Pro Arg Pro Leu Glu Leu Ala Leu Leu Ile Leu Gly | | |
| 115 | 120 | 125 |
| Val Gly Leu Leu Asp Phe Cys Gly Gln Val Cys Phe Thr Pro Leu Glu | | |
| 130 | 135 | 140 |
| Ala Leu Leu Ser Asp Leu Phe Arg Asp Pro Asp His Cys Arg Gln Ala | | |
| 145 | 150 | 155 |
| Tyr Ser Val Tyr Ala Phe Met Ile Ser Leu Gly Gly Cys Leu Gly Tyr | | |
| 165 | 170 | 175 |
| Leu Leu Pro Ala Ile Asp Trp Asp Thr Ser Ala Leu Ala Pro Tyr Leu | | |
| 180 | 185 | 190 |
| Gly Thr Gln Glu Glu Cys Leu Phe Gly Leu Leu Thr Leu Ile Phe Leu | | |
| 195 | 200 | 205 |
| Thr Cys Val Ala Ala Thr Leu Val Ala Glu Glu Ala Ala Leu Gly | | |
| 210 | 215 | 220 |
| Pro Thr Glu Pro Ala Glu Gly Leu Ser Ala Pro Ser Leu Ser Pro His | | |
| 225 | 230 | 235 |
| Cys Cys Pro Cys Arg Ala Arg Leu Ala Phe Arg Asn Leu Gly Ala Leu | | |
| 245 | 250 | 255 |
| Leu Pro Arg Leu His Gln Leu Cys Cys Arg Met Pro Arg Thr Leu Arg | | |

```

      260      265      270
Arg Leu Phe Val Ala Glu Leu Cys Ser Trp Met Ala Leu Met Thr Phe
      275      280      285
Thr Leu Phe Tyr Thr Asp Phe Val Gly Glu Gly Leu Tyr Gln Gly Val
      290      295      300
Pro Arg Ala Glu Pro Gly Thr Glu Ala Arg Arg His Tyr Asp Glu Gly
      305      310      315      320
Val Arg Met Gly Ser Leu Gly Leu Phe Leu Gln Cys Ala Ile Ser Leu
      325      330      335
Val Phe Ser Leu Val Met Asp Arg Leu Val Gln Arg Phe Gly Thr Arg
      340      345      350
Ala Val Tyr Leu Ala Ser Val Ala Ala Phe Pro Val Ala Ala Gly Ala
      355      360      365
Thr Cys Leu Ser His Ser Val Ala Val Val Thr Ala Ser Ala Ala Leu
      370      375      380
Thr Gly Phe Thr Phe Ser Ala Leu Gln Ile Leu Pro Tyr Thr Leu Ala
      385      390      395      400
Ser Leu Tyr His Arg Glu Lys Gln Val Phe Leu Pro Lys Tyr Arg Gly
      405      410      415
Asp Thr Gly Gly Ala Ser Ser Glu Asp Ser Leu Met Thr Ser Phe Leu
      420      425      430
Pro Gly Pro Lys Pro Gly Ala Pro Phe Pro Asn Gly His Val Gly Ala
      435      440      445
Gly Gly Ser Gly Leu Leu Pro Pro Pro Pro Ala Leu Cys Gly Ala Ser
      450      455      460
Ala Cys Asp Val Ser Val Arg Val Val Val Gly Glu Pro Thr Glu Ala
      465      470      475      480
Arg Val Val Pro Gly Arg Gly Ile Cys Leu Asp Leu Ala Ile Leu Asp
      485      490      495
Ser Ala Phe Leu Leu Ser Gln Val Ala Pro Ser Leu Phe Met Gly Ser
      500      505      510
Ile Val Gln Leu Ser Gln Ser Val Thr Ala Tyr Met Val Ser Ala Ala
      515      520      525
Gly Leu Gly Leu Val Ala Ile Tyr Phe Ala Thr Gln Val Val Phe Asp
      530      535      540
Lys Ser Asp Leu Ala Lys Tyr Ser Ala
      545      550

```

<210> 114

<211> 241

<212> PRT

<213> Homo sapien

<400> 114

```

Met Gln Cys Phe Ser Phe Ile Lys Thr Met Met Ile Leu Phe Asn Leu
  1          5          10          15
Leu Ile Phe Leu Cys Gly Ala Ala Leu Leu Ala Val Gly Ile Trp Val
      20      25      30
Ser Ile Asp Gly Ala Ser Phe Leu Lys Ile Phe Gly Pro Leu Ser Ser
      35      40      45
Ser Ala Met Gln Phe Val Asn Val Gly Tyr Phe Leu Ile Ala Ala Gly
      50      55      60
Val Val Val Phe Ala Leu Gly Phe Leu Gly Cys Tyr Gly Ala Lys Thr
      65      70      75      80
Glu Ser Lys Cys Ala Leu Val Thr Phe Phe Phe Ile Leu Leu Leu Ile

```



```
<210> 115
<211> 366
<212> DNA
<213> Homo sapien
```

```
<210> 116
<211> 282
<212> DNA
<213> Homo sapien
```

```
<210> 117
<211> 305
```

<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(305)
<223> n = A,T,C or G

<400> 117

| | |
|--|-----|
| acacatgtcg cttcactgcc ttcttagatg cttctgggtca acatanagga acagggacca | 60 |
| tatttatcct ccctcctgaa acaattgcaa aataanacaa aatatatgaa acaattgcaa | 120 |
| aataaggcaa aatatatgaa acaacaggtc tgcgatatatt ggaaatcagt caatgaagga | 180 |
| tactgatccc tgatcactgt cctaattgcag gatgtgggaa acagatgagg tcacctctgt | 240 |
| gactgcccc gcttactgcc tgtagagagt ttctangctg cagttcagac agggagaaat | 300 |
| tggt | 305 |

<210> 118
<211> 71
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(71)
<223> n = A,T,C or G

<400> 118

| | |
|--|----|
| accaagggtgt ntgaatctct gacgtgggga tctctgattc ccgcacaatc tgagtggaaa | 60 |
| aantcctggg t | 71 |

<210> 119
<211> 212
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(212)
<223> n = A,T,C or G

<400> 119

| | |
|---|-----|
| actccggttg gtgtcagcag cacgtggcat tgaacatngc aatgtggagc ccaaaccaca | 60 |
| gaaaatgggg tgaaattggc caactttcta tnaacttatg ttggcaantt tgccaccaac | 120 |
| agtaagctgg cccttctaataaaaagaaaat tgaaaggttt ctcactaanc ggaattaant | 180 |
| aatggantca aganactccc aggcctcagc gt | 212 |

<210> 120
<211> 90
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(90)
<223> n = A,T,C or G

<400> 120
actcgttgca natcaggggc cccccagagt caccgttgca ggagtccttc tggctcttgcc 60
ctccgccggc gcagaacatg ctggggtggt 90

<210> 121
<211> 218
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(218)
<223> n = A,T,C or G

<400> 121
tgtancgtga anacgacaga nagggttgct aaaaatggag aanccttgaa gtcattttga 60
gaataagatt tgctaaaaga tttggggcta aaacatgggt attgggagac atttctgaag 120
atatncangt aaattangga atgaattcat gggtcttttg ggaattcctt tacgatngcc 180
agcatanact tcatgtgggg atancagcta cccttgta 218

<210> 122
<211> 171
<212> DNA
<213> Homo sapien

<400> 122
taggggtgta tgcaactgta aggacaaaaa ttgagactca actggcttaa ccaataaagg 60
catttgtag ctcatggaac aggaagtcgg atgggtgggc atcttcagtg ctgcatgagt 120
caccaccccg gcggggtcat ctgtgccaca ggccctgtt gacagtgcgg t 171

<210> 123
<211> 76
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(76)
<223> n = A,T,C or G

<400> 123
tgtagcgtga agacnacaga atgggtgtgtg ctgtgctatc caggaacaca tttattatca 60
ttatcaanta ttgtgt 76

<210> 124
<211> 131
<212> DNA
<213> Homo sapien

<400> 124
acctttcccc aaggccaatg tcctgtgtgc taactggccg gctgcaggac agctgcaatt 60
caatgtgctg ggtcatatgg aggggaggag actctaaaat agccaatttt attctcttgg 120
ttaagatttg t 131

<210> 125
<211> 432
<212> DNA
<213> Homo sapien

<400> 125
acttttatcta ctggctatga aatagatggg ggaaaattgc gttaccaact ataccactgg 60
cttgaaaaag aggtgatagc tcttcagagg acttgtgact ttgtctcaga tgctgaagaa 120
ctacagtctg catttggcag aaatgaagat gaatttggat taaatgagga tgctgaagat 180
ttgcctcacc aaacaaaagt gaaacaactg agagaaaatt ttcaggaaaa aagacagtgg 240
ctcttgaagt atcagtcact tttgagaatg tttcttagtt actgcatact tcatggatcc 300
catggtgggg gtcttgcac tgtaagaatg gaattgattt tgcttttgca agaattctcag 360
caggaaacat cagaaccact attttctagc cctctgtcag agcaaaccctc agtgccctctc 420
ctctttgctt gt 432

<210> 126
<211> 112
<212> DNA
<213> Homo sapien

<400> 126
acacaacttg aatagtaaaa tagaaactga gctgaaattt ctaattcact ttctaaccat 60
agtaagaatg atatttcccc ccagggatca ccaaatttt ataaaaattt gt 112

<210> 127
<211> 54
<212> DNA
<213> Homo sapien

<400> 127
accacgaaac cacaacaag atggaagcat caatccactt gccaaagcaca gcag 54

<210> 128
<211> 323
<212> DNA
<213> Homo sapien

<400> 128
acctcattag taattgtttt gttgtttcat ttttttctaa tgtctcccct ctaccagctc 60
acctgagata acagaatgaa aatggaagga cagccagatt tctcctttgc tctctgctca 120
ttctctctga agtctagggt acccattttg gggaccatt ataggcaata aacacagttc 180
ccaaagcatt tggacagttt cttgtgtgtg tttagaatgg ttttcctttt tcttagcctt 240
ttcctgcaaa aggtcactc agtcccttgc ttgctcagtg gactgggctc cccagggcct 300
aggctgcctt cttttccatg tcc 323

<210> 129
<211> 192
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(192)
<223> n = A,T,C or G

<400> 129
acatacatgt gtgtatatatt ttaaatatca cttttgtatc actctgactt ttttagcatac 60
tgaaaacaca ctaacataat ttntgtgaac catgatcaga tacaacccaa atcattcatc 120
tagcacattc atctgtgata naaagatagg tgagtttcat ttccttcacg ttggccaatg 180
gataaacaaa gt 192

<210> 130

<211> 362

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (362)

<223> n = A,T,C or G

<400> 130
ccctttttta tggaatgagt agactgtatg tttgaanatt tanccacaac ctctttgaca 60
tataatgacg caacaaaaag gtgctgttta gtcctatggg tcagtttatg cccctgacaa 120
gtttccattg tgttttgccg atcttctggc taatcgtggg atcctccatg ttattagtaa 180
ttctgtattc cattttgtta acgcctggta gatgtaacct gctangaggc taactttata 240
cttatttaaa agctcttatt ttgtgggtcat taaaatggca atttatgtgc agcactttat 300
tgcagcagga agcacgtgtg gggtgggtgt aaagctcttt gctaacttta aaaagtaatg 360
gg 362

<210> 131

<211> 332

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (332)

<223> n = A,T,C or G

<400> 131
ctttttgaaa gatcgtgtcc actcctgtgg acatcttggt ttaatggagt ttcccatgca 60
gtangactgg tatggttgca gctgtccaga taaaaacatt tgaagagctc caaaatgaga 120
gttctcccag gttegccttg ctgctccaag tctcagcagc agcctctttt aggaggcatc 180
ttctgaacta gattaaggca gcttgtaa atctgatgtgat ttgggtttatt atccaactaa 240
cttccatctg ttatcactgg agaaagccca gactccccan gacnggtacg gattgtgggc 300
atanaaggat tgggtgaagc tggcgttgtg gt 332

<210> 132

<211> 322

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (322)

<223> n = A,T,C or G

<400> 132
acttttgcca ttttgtatat ataaacaatc ttgggacatt ctctgaaaa ctaggtgtcc 60

```

agtggttaag agaactcgat ttcaagcaat tctgaaagga aaaccagcat gacacagaat    120
ctcaaattcc caaacagggg ctctgtggga aaaatgaggg aggaccttg tatctcgggt    180
tttagcaagt taaaatgaan atgacaggaa aggcttattt atcaacaaag agaagagttg    240
ggatgcttct aaaaaaaact ttggtagaga aaataggaat gctnaatcct agggaagcct    300
gtaacaatct acaattggtc ca                                           322

```

<210> 133

<211> 278

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (278)

<223> n = A,T,C or G

<400> 133

```

acaagccttc acaagtttaa ctaaattggg attaatcttt ctgtanttat ctgcataatt    60
cttggttttc tttccatctg gctcctgggt tgacaatttg tggaaacaac tctattgcta    120
ctatttaaaa aaaatcacaa atctttccct ttaagctatg ttnaattcaa actattcctg    180
ctattcctgt tttgtcaaag aaattatatt tttcaaaata tgtntatttg tttgatgggt    240
cccacgaac actaataaaa accacagaga ccagcctg                               278

```

<210> 134

<211> 121

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (121)

<223> n = A,T,C or G

<400> 134

```

gtttanaaaa cttgttttagc tccatagagg aaagaatggt aaactttgta ttttaaaaca    60
tgattctctg aggttaaact tgggtttcaa atgttatttt tacttgtatt ttgcttttgg    120
t                                                                    121

```

<210> 135

<211> 350

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (350)

<223> n = A,T,C or G

<400> 135

```

acttanaacc atgcctagca catcagaatc cctcaaagaa catcagtata atcctataacc    60
atanaaagtg gtgactgggt aagcgtgcga caaaggtcag ctggcacatt acttgtgtgc    120
aaacttgata cttttgttct aagtaggaac tagtatacag tncctaggan tggtagtcca    180
gggtgcccc caactcctgc agccgctcct ctgtgccagn ccctgnaagg aactttcgct    240
ccacctcaat caagccctgg gccatgctac ctgcaattgg ctgaacaaac gtttgctgag    300
ttcccaagga tgcaaagcct ggtgctcaac tcctggggcg tcaactcagt             350

```

<210> 136
 <211> 399
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(399)
 <223> n = A,T,C or G

<400> 136
 tgtaccgtga agacgacaga agttgcatgg cagggacagg gcagggccga ggccagggtt 60
 gctgtgattg tatccgaata ntccctcgtga gaaaagataa tgagatgacg tgagcagcct 120
 gcagacttgt gtctgccttc aanaagccag acaggaaggc cctgcctgcc ttggctctga 180
 cctggcggcc agccagccag ccacaggtgg gcttcttctt tttgtggtga caacnccaag 240
 aaaactgcag aggcccaggg tcaggtgtna gtgggtangt gaccataaaa caccaggtgc 300
 tcccaggaac ccgggcaaag gccatcccca cctacagcca gcatgccac tggcgtgatg 360
 ggtgcagang gatgaagcag ccagntgttc tgctgtggt 399

<210> 137
 <211> 165
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(165)
 <223> n = A,T,C or G

<400> 137
 actggtgtgg tnggggggtga tgctgggtgg anaagttgan gtgacttcan gatggtgtgt 60
 ggaggaagtg tgtgaacgta gggatgtaga ngttttggcc gtgctaaatg agcttcggga 120
 ttggctggtc ccactgggtg tcactgtcat tgggtggggt cctgt 165

<210> 138
 <211> 338
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(338)
 <223> n = A,T,C or G

<400> 138
 actcactgga atgccacatt cacaacagaa tcagaggtct gtgaaaacat taatggctcc 60
 ttaacttctc cagtaagaat cagggacttg aaatggaaac gtaaacagcc acatgcccac 120
 tgctgggcag tctcccatgc cttccacagt gaaagggctt gagaaaaatc acatccaatg 180
 tcatgtgttt ccagccacac caaaaggtgc ttgggggtgga gggctggggg catananggt 240
 cangcctcag gaagcctcaa gttccattca gctttgccac tgtacattcc ccatntttaa 300
 aaaaactgat gccttttttt tttttttttg taaaattc 338

<210> 139
 <211> 382

<212> DNA

<213> Homo sapien

<400> 139

| | |
|---|-----|
| gggaatcttg gtttttggca tctgggttgc ctatagccga ggccactttg acagaacaaa | 60 |
| gaaagggact tcgagtaaga aggtgattta cagccagcct agtgcccgaa gtgaaggaga | 120 |
| attcaaacag acctcgtcac tcttggtgtg agcctggctg gctcaccgcc tatcatctgc | 180 |
| atttgcctta ctcaggtgct accggactct ggccctgat gtctgtagtt tcacaggatg | 240 |
| ccttatttgt cttctacacc ccacagggcc ccctacttct tcggatgtgt ttttaataat | 300 |
| gtcagctatg tgcccatcc tcttcatgc cctccctccc tttcctacca ctgctgagtg | 360 |
| gcctggaact tgtttaaagt gt | 382 |

<210> 140

<211> 200

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(200)

<223> n = A,T,C or G

<400> 140

| | |
|--|-----|
| accaaancctt ctttctgttg tgttngattt tactataggg gtttngcttn ttctaaanat | 60 |
| acttttcatt taacancctt tgtaagtgt caggctgcac tttgctccat anaattattg | 120 |
| ttttcacatt tcaacttgta tgtgtttgtc tcttanagca ttggtgaaat cacatatttt | 180 |
| atattcagca taaaggagaa | 200 |

<210> 141

<211> 335

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(335)

<223> n = A,T,C or G

<400> 141

| | |
|---|-----|
| actttatttt caaaacactc atatgttgca aaaaacacat agaaaaataa agtttggtgg | 60 |
| gggtgctgac taaacttcaa gtcacagact tttatgtgac agattggagc agggtttgtt | 120 |
| atgcatgtag agaaccctaa ctaatttatt aaacaggata gaaacaggct gtctgggtga | 180 |
| aatggttctg agaaccatcc aattcacctg tcagatgctg atanactagc tcttcagatg | 240 |
| tttttctacc agttcagaga tnggttaatg actantcca atgggggaaa agcaagatgg | 300 |
| attcacaaac caagtaattt taaacaaaga cactt | 335 |

<210> 142

<211> 459

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(459)

<223> n = A,T,C or G

<400> 142
 accagggttaa tattgccaca tatatccttt ccaattgctg gctaaacaga cgtgtattta 60
 ggggtgttta aagacaaccc agcttaatat caagagaaat tgtgaccttt catggagtat 120
 ctgatggaga aaacactgag ttttgacaaa tcttatttta ttcagatagc agtctgatca 180
 cacatggtcc aacaacactc aaataataaa tcaaataatna tcagatgtta aagattggtc 240
 ttcaaacatc atagccaatg atgccccgct tgcctataat ctctccgaca taaaaccaca 300
 tcaacacctc agtggccacc aaaccattca gcacagcttc cttaactgtg agctgtttga 360
 agctaccagt ctgagcacta ttgactatnt ttttcangct ctgaatagct ctagggatct 420
 cagcangggg gggaggaacc agtcaacct tggcgtant 459

<210> 143
 <211> 140
 <212> DNA
 <213> Homo sapien

<400> 143
 acatttcctt ccaccaagtc aggactcctg gcttctgtgg gagttcttat cacctgaggg 60
 aaatccaaac agtctctcct agaaaggaat agtgtcacca accccaccca tctccctgag 120
 accatccgac ttcctgtgt 140

<210> 144
 <211> 164
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(164)
 <223> n = A,T,C or G

<400> 144
 acttcagtaa caacatacaa taacaacatt aagtgtatat tgccatcttt gtcattttct 60
 atctatacca ctctcccttc tgaaaacaan aatcactanc caatcactta taaaatttg 120
 aggcaattaa tccatatttg ttttcaataa ggaaaaaaag atgt 164

<210> 145
 <211> 303
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(303)
 <223> n = A,T,C or G

<400> 145
 acgtagacca tccaactttg tatttgtaat ggcaaacatc cagnagcaat tcctaaacaa 60
 actggagggg atttataccc aattatccca ttcattaaca tgccctctc ctcaggctat 120
 gcaggacagc tatcataagt cggcccaggc atccagatac taccatttgt ataaacttca 180
 gtaggggagt ccatccaagt gacaggtcta atcaaaggag gaaatggaac ataagcccag 240
 tagtaaaatn ttgcttagct gaaacagcca caaaagactt accgccgtgg tgattaccat 300
 caa 303

<210> 146

<211> 327
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(327)
 <223> n = A,T,C or G

<400> 146
 actgcagctc aattagaagt ggtctctgac tttcatcanc ttctccctgg gctccatgac 60
 actggcctgg agtgactcat tgctctgggt gggtgagaga gtccttttgc caacaggcct 120
 ccaagtcagg gctgggattt gtttcctttc cacattctag caacaatatg ctggccactt 180
 cctgaacagg gaggggtgga ggagccagca tggacaagc tgccactttc taaagtagcc 240
 agacttgccc ctgggcctgt cacacctact gatgaccttc tgtgcctgca ggatggaatg 300
 taggggtgag ctgtgtgact ctatggt 327

<210> 147
 <211> 173
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(173)
 <223> n = A,T,C or G

<400> 147
 acattgtttt tttagataa agcattgana gagctctcct taacgtgaca caatggaagg 60
 actggaacac ataccacat ctttgttctg agggataatt ttctgataaa gtcttgctgt 120
 atattcaagc acatatgtta tatattattc agttccatgt ttatagccta gtt 173

<210> 148
 <211> 477
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(477)
 <223> n = A,T,C or G

<400> 148
 acaaccactt tatctcatcg aatttttaac ccaaactcac tcactgtgcc tttctatcct 60
 atgggatata ttatttgatg ctccatttca tcacacatat atgaataata cactcactact 120
 gccctactac ctgctgcaat aatcacattc ccttcctgtc ctgaccctga agccattggg 180
 gtggctctag tggccatcag tccangcctg caccttgagc ccttgagctc cattgctcac 240
 nccanccac ctcaccgacc ccatcctctt acacagctac ctccttgctc tctaacccca 300
 tagattatnt ccaaattcag tcaattaagt tactattaac actctaccg acatgtccag 360
 caccactggg aagccttctc cagccaacac acacacacac acacncacac acacacatat 420
 ccaggcacag gctacctcat cttcacaatc acccctttaa ttaccatgct atgggtgg 477

<210> 149
 <211> 207
 <212> DNA

<213> Homo sapien

<400> 149

```
acagttgtat tataatatca agaaataaac ttgcaatgag agcattttaag agggaagaac      60
taacgtatatt tagagagcca aggaagggtt ctgtggggag tgggatgtaa ggtggggcct      120
gatgataaat aagagtcagc caggtaagtg ggtggtgtgg tatgggcaca gtgaagaaca      180
tttcaggcag agggaacagc agtgaaa                                           207
```

<210> 150

<211> 111

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (111)

<223> n = A,T,C or G

<400> 150

```
accttgattt cattgctgct ctgatggaaa cccaactatc taatttagct aaaacatggg      60
cacttaaatg tggtcagtgt ttggacttgt taactantgg catctttggg t                111
```

<210> 151

<211> 196

<212> DNA

<213> Homo sapien

<400> 151

```
agcgcggcag gtcatttga acattccaga tacctatcat tactcgatgc tgttgataac      60
agcaagatgg ctttgaactc agggtcacca ccagctattg gaccttacta tgaaaaccat      120
ggataccaac cggaaaaccc ctatcccga cagccactg tgggtcccccac tgtctacgag      180
gtgcatccgg ctcagt                                                         196
```

<210> 152

<211> 132

<212> DNA

<213> Homo sapien

<400> 152

```
acagcacttt cacatgtaag aaggagaaa ttcctaaatg taggagaaa ataacagaac      60
cttccccctt tcatctagtg gtggaaacct gatgctttat gttgacagga atagaaccag      120
gagggagttt gt                                                         132
```

<210> 153

<211> 285

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (285)

<223> n = A,T,C or G

<400> 153

```
acaanaccca nganaggcca ctggccgtgg tgtcatggcc tccaaacatg aaagtgtcag      60
```

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| cttctgctct | tatgtcctca | tctgacaact | ctttaccatt | tttatcctcg | ctcagcagga | 120 |
| gcacatcaat | aaagtccaaa | gtcttggaact | tggccttggc | ttggaggaag | tcacaaacac | 180 |
| cctggctagt | gaggggtcgg | cgccgctcct | ggatgacggc | atctgtgaag | tcgtgcacca | 240 |
| gtctgcaggc | cctgtggaag | cgccgtccac | acggagtnag | gaatt | | 285 |

<210> 154

<211> 333

<212> DNA

<213> Homo sapien

<400> 154

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| accacagtcc | tggttggcca | gggcttcatg | accctttctg | tgaaaagcca | tattatcacc | 60 |
| accccaaatt | tttccttaa | tatctttaac | tgaaggggtc | agcctcttga | ctgcaaagac | 120 |
| cctaagccgg | ttacacagct | aactccact | ggccttgatt | tgtgaaattg | ctgctgcctg | 180 |
| attggcacag | gagtcgaagg | tggtcagctc | ccctcctccg | tggaacgaga | ctctgatttg | 240 |
| agtttcacaa | attctcgggc | cacctegtca | ttgctcctct | gaaataaaat | ccggagaatg | 300 |
| gtcaggcctg | tctcatccat | atggatcttc | cgg | | | 333 |

<210> 155

<211> 308

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(308)

<223> n = A,T,C or G

<400> 155

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| actggaaata | ataaaaccca | catcacagtg | ttgtgtcaaa | gatcatcagg | gcatggatgg | 60 |
| gaaagtgctt | tggaactgt | aaagtgccta | acacatgata | gatgattttt | gttataatat | 120 |
| ttgaatcacg | gtgcatacaa | actctcctgc | ctgctcctcc | tgggccccag | ccccagcccc | 180 |
| atcacagctc | actgctctgt | tcateccaggc | ccagcatgta | gtggctgatt | cttcttggtt | 240 |
| gcttttagcc | tccanaagtt | tctctgaagc | caaccaaacc | tctangtgta | aggcatgctg | 300 |
| gccctggt | | | | | | 308 |

<210> 156

<211> 295

<212> DNA

<213> Homo sapien

<400> 156

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| accttgctcg | gtgcttgga | catattagga | actcaaaata | tgagatgata | acagtgccta | 60 |
| ttattgatta | ctgagagaac | tgtagacat | ttagttgaag | attttctaca | caggaactga | 120 |
| gaataggaga | ttatgtttgg | ccctcatatt | ctctcctatc | ctccttgcc | cattctatgt | 180 |
| ctaatatatt | ctcaatcaaa | taaggtttagc | ataatcagga | aatcgaccaa | ataccaatat | 240 |
| aaaaccagat | gtctatcctt | aagattttca | aatagaaaac | aaattaacag | actat | 295 |

<210> 157

<211> 126

<212> DNA

<213> Homo sapien

<400> 157

| | | | | | | |
|------------|------------|------------|------------|------------|------------|----|
| acaagtttaa | atagtgctgt | cactgtgcat | gtgctgaaat | gtgaaatcca | ccacatttct | 60 |
|------------|------------|------------|------------|------------|------------|----|

gaagagcaaa acaaattctg tcatgtaatc tctatcttgg gtcgtgggta tatctgtccc 120
cttagt 126

<210> 158

<211> 442

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(442)

<223> n = A,T,C or G

<400> 158

accactggt cttggaaca cccatcctta atacgatgat tttctgtcg tgtgaaaatg 60
aanccagcag gctgcccta gtcagtcctt cctccagag aaaaagagat ttgagaaagt 120
gcctgggtaa ttcaccatta atttctccc ccaaactctc tgagtcttcc cttaatat 180
ctggtggttc tgaccaaagc aggtcatggt ttgttgagca tttgggatcc cagtgaagta 240
natgtttgta gccttgcata cttagccctt cccacgcaca aacggagtgg cagagtgggtg 300
ccaaccctgt tttccagtc cacgtagaca gattcacagt gcggaattct ggaagctgga 360
nacagacggg ctctttgcag agccgggact ctgagangga catgagggcc tctgcctctg 420
tgttcattct ctgatgtcct gt 442

<210> 159

<211> 498

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(498)

<223> n = A,T,C or G

<400> 159

acttccaggt aacgttgttg tttccgttga gcctgaactg atgggtgacg ttgtaggttc 60
tccaacaaga actgaggttg cagagcgggt agggagagat gctgttccag ttgcacctgg 120
gctgctgtgg actgttgttg attcctcact acggcccaag gttgtggaac tggcanaaag 180
gtgtgttgtt gganttgagc tcgggcggct gtggtaggtt gtgggctctt caacaggggc 240
tgctgtggtg ccgggangtg aangtgttgt gtcacttgag cttggccagc tctggaaagt 300
antanattct tcctgaaggc cagcgcttgt ggagctggca ngggtcantg ttgtgtgtaa 360
cgaaccagtg ctgctgtggg tgggtgtana tcctccacaa agcctgaagt tatggtgtcn 420
tcaggtaana atgtggtttc agtgtccctg ggcngctgtg gaaggttgta nattgtcacc 480
aagggaataa gctgtggt 498

<210> 160

<211> 380

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(380)

<223> n = A,T,C or G

<400> 160

| | |
|--|-----|
| acctgcatcc agcttccttg ccaaaactcac aaggagacat caacctctag acagggaaac | 60 |
| agcttcagga tacttccagg agacagagcc accagcagca aaacaaatat tcccatgcct | 120 |
| ggagcatggc atagaggaag ctganaaatg tggggtctga ggaagccatt tgagtctggc | 180 |
| cactagacat ctcacagcc acttggtgga agagatgccc catgacccca gatgcctctc | 240 |
| ccacccttac ctccatctca cacacttgag ctttccactc tgtataattc taacatcctg | 300 |
| gagaaaaatg gcagtttgac cgaacctgtt cacaacggta gaggctgatt tctaacgaaa | 360 |
| cttgtagaat gaagcctgga | 380 |

<210> 161

<211> 114

<212> DNA

<213> Homo sapien

<400> 161

| | |
|--|-----|
| actccacatc cctctgagc aggcgggtgt cgttcaaggt gtatttggcc ttgcctgtca | 60 |
| cactgtccac tggcccctta tccacttggt gcttaatccc tcgaaagagc atgt | 114 |

<210> 162

<211> 177

<212> DNA

<213> Homo sapien

<400> 162

| | |
|---|-----|
| actttctgaa tcgaatcaaa tgatacttag tgtagtttta atatcctcat atatatcaaa | 60 |
| gttttactac tctgataatt ttgtaaacca ggtaaccaga acatccagtc atacagcttt | 120 |
| tggtgatata taacttgga ataaccaggt ctggtgatac ataaaactac tcactgt | 177 |

<210> 163

<211> 137

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(137)

<223> n = A,T,C or G

<400> 163

| | |
|---|-----|
| catttatata gacaggcgtg aagacattca cgacaaaaac gcgaaattct atcccgtgac | 60 |
| canagaaggc agctacggct actcctacat cctggcgtgg gtggccttcg cctgcacctt | 120 |
| catcagcggc atgatgt | 137 |

<210> 164

<211> 469

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(469)

<223> n = A,T,C or G

<400> 164

| | |
|---|-----|
| cttatcacia tgaatgttct cctgggcagc gttgtgatct ttgccacctt cgtgacttta | 60 |
| tgcaatgcat catgctattt catacctaag gagggagttc caggagattc aaccaggaaa | 120 |

| | | | | | | |
|-------------|------------|------------|------------|------------|------------|-----|
| tgcattggatc | tcaaaggaaa | caaacaccca | ataaactcgg | agtggcagac | tgacaactgt | 180 |
| gagacatgca | cttgctacga | aacagaaatt | tcatgttgca | cccttgtttc | tacacctgtg | 240 |
| ggttatgaca | aagacaactg | caaagaatc | ttcaagaagg | aggactgcaa | gtatatcgtg | 300 |
| gtggagaaga | aggacccaaa | aaagacctgt | tctgtcagtg | aatggataat | ctaattgtgt | 360 |
| tctagtaggc | acagggctcc | caggccaggc | ctcattctcc | tctggcctct | aatagtcaat | 420 |
| gattgtgtag | ccatgcctat | cagtaaaaag | atntttgagc | aaacacttt | | 469 |

<210> 165

<211> 195

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(195)

<223> n = A,T,C or G

<400> 165

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| acagtttttt | atanatatcg | acattgcccgg | cacttgtgtt | cagtttcata | aagctgggtg | 60 |
| atccgctgtc | atccactatt | ccttggctag | agtaaaaatt | attcttatag | cccatgtccc | 120 |
| tgcaggccgc | ccgcccgtag | ttctcggtcc | agtcgtcttg | gcacacaggg | tgccaggact | 180 |
| tcctctgaga | tgagt | | | | | 195 |

<210> 166

<211> 383

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(383)

<223> n = A,T,C or G

<400> 166

| | | | | | | |
|------------|------------|------------|-------------|------------|-------------|-----|
| acatcttagt | agtgtggcac | atcagggggc | catcaggggtc | acagtcactc | atagcctcgc | 60 |
| cgaggtcgga | gtccacacca | ccggtgtagg | tgtgtctaat | cttgggcttg | gcgcccacct | 120 |
| ttggagaagg | gatatgctgc | acacacatgt | ccacaaagcc | tgtgaactcg | ccaaagaatt | 180 |
| tttgacagac | agcctgagca | agggggcgat | gttcagcttc | agctcctcct | tcgtcagggtg | 240 |
| gatgccaacc | tcgtctangg | tcggtgggaa | gctggtgtcc | acntcaccta | caacctgggc | 300 |
| gangatctta | taaagaggct | ccnagataaa | ctccacgaaa | cttctctggg | agctgctagt | 360 |
| nggggccttt | ttggtgaact | ttc | | | | 383 |

<210> 167

<211> 247

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(247)

<223> n = A,T,C or G

<400> 167

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| acagagccag | accttggcca | taaatgaanc | agagattaag | actaaacccc | aagtcganat | 60 |
| tggagcagaa | actggagcaa | gaagtgggccc | tggggctgaa | gtagagacca | aggccactgc | 120 |

| | |
|--|-----|
| tatanccata cacagagcca actctcaggc caaggcnatg gttggggcag anccagagac | 180 |
| tcaatctgan tccaaagtgg tggctggaac actggctcatg acanaggcag tgactctgac | 240 |
| tgangtc | 247 |

<210> 168

<211> 273

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(273)

<223> n = A,T,C or G

<400> 168

| | |
|--|-----|
| acttctaagt tttctagaag tggaaggatt gtantcatcc tgaaaatggg tttacttcaa | 60 |
| aatccctcan ccttgttctt cacnactgtc tatactgana gtgtcatggt tccacaaagg | 120 |
| gctgacacct gagectgnat tttcactcat ccctgagaag ccctttccag taggggtgggc | 180 |
| aattcccaac ttccttgcca caagcttccc aggctttctc ccctggaaaa ctccagcttg | 240 |
| agtcccagat acactcatgg gctgccctgg gca | 273 |

<210> 169

<211> 431

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(431)

<223> n = A,T,C or G

<400> 169

| | |
|--|-----|
| acagccttgg cttccccaaa ctccacagtc tcagtgcaga aagatcatct tccagcagtc | 60 |
| agctcagacc aggggtcaaag gatgtgacat caacagtttc tggtttcaga acaggttcta | 120 |
| ctactgtcaa atgacccccc atacttctc aaaggctgtg gtaagttttg cacagggtgag | 180 |
| ggcagcagaa aggggggtant tactgatgga caccatcttc tctgtatact ccacactgac | 240 |
| cttgccatgg gcaaaggccc ctaccacaaa aacaatagga tctactgctgg gcaccagctc | 300 |
| acgcacatca ctgacaaccg ggatggaaaa agaantgcca actttcatac atccaactgg | 360 |
| aaagtgatct gatactggat tottaattac cttcaaaagc ttctgggggc catcagctgc | 420 |
| tcgaacactg a | 431 |

<210> 170

<211> 266

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(266)

<223> n = A,T,C or G

<400> 170

| | |
|--|-----|
| acctgtgggc tgggctgtta tgctgtgcc ggctgctgaa agggagttca gaggtggagc | 60 |
| tcaaggagct ctgcaggcat ttgccaanc ctctccanag canagggagc aacctacact | 120 |
| ccccgctaga aagacaccag attggagtcc tgggaggggg agttgggggtg ggcatttgat | 180 |

gtatacttgt cacctgaatg aangagccag agaggaanga gacgaanatg anattggcct 240
tcaaagctag gggctctggca ggtgga 266

<210> 171

<211> 1248

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(1248)

<223> n = A,T,C or G

<400> 171

```

ggcagccaaa tcataaacgg cgaggactgc agcccgcaact cgcagccctg gcaggcggca 60
ctgggtcatgg aaaacgaatt gttctgctcg ggcgtccttg tgcattccgca gtgggtgctg 120
tcagcccgac actgtttcca gaagtgaagt cagagctcct acaccatcgg gctgggcctg 180
cacagtcttg aggccgacca agagccaggg agccagatgg tggaggccag cctctccgta 240
cggcaccag agtacaacag acccttgctc gctaacgacc tcatgctcat caagttggac 300
gaatccgtgt ccgagtctga caccatccgg agcatcagca ttgcttcgca gtgccctacc 360
gcgggggaact cttgcctcgt ttctggctgg ggtctgctgg cgaacggcag aatgcctacc 420
gtgctgcagt gcgtgaacgt gtcggtggtg tctgaggagg tctgcagtaa gctctatgac 480
ccgctgtacc accccagcat gttctgcgcc ggcggagggg aagaccagaa ggactcctgc 540
aacggtgact ctggggggcc cctgatctgc aacgggtact tgcagggcct tgtgtcttcc 600
ggaaaagccc cgtgtggcca agttggcgtg ccaggtgtct acaccaacct ctgcaaattc 660
actgagtgga tagagaaaac cgtccaggcc agttaactct ggggactggg aacccatgaa 720
attgaccccc aaatacatcc tgcggaagga attcaggaat atctgttccc agccctcct 780
ccctcaggcc caggagtcca ggccccagc ccctcctccc tcaaaccaag ggtacagatc 840
cccagccct cctccctcag acccaggagt ccagaccccc cagccctcc tccctcagac 900
ccaggagtcc agccctcct ccctcagacc caggagtcca gacccccag cccctcctcc 960
ctcagaccca ggggtccagg cccccaaccc ctctcctcc agactcagag gtccaagccc 1020
ccaaccntc attccccaga cccagaggtc caggtccag cccctcntcc ctcagaccca 1080
gcggtccaat gccacctaga ctntccctgt acacagtgcc cccttgtagg acgttgaccc 1140
aaccttacca gttggttttt catttttngt ccctttcccc tagatccaga aataaagttt 1200
aagagaagng caaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaa 1248

```

<210> 172

<211> 159

<212> PRT

<213> Homo sapien

<220>

<221> VARIANT

<222> (1)...(159)

<223> Xaa = Any Amino Acid

<400> 172

```

Met Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro
1           5           10           15
Leu Leu Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser
20           25           30
Glu Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr
35           40           45
Ala Gly Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly
50           55           60

```

```

Arg Met Pro Thr Val Leu Gln Cys Val Asn Val Ser Val Val Ser Glu
65                               70                               75                               80
Glu Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe
                               85                               90                               95
Cys Ala Gly Gly Gly Gln Xaa Gln Xaa Asp Ser Cys Asn Gly Asp Ser
                               100                              105                              110
Gly Gly Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe
                               115                              120                              125
Gly Lys Ala Pro Cys Gly Gln Val Gly Val Pro Gly Val Tyr Thr Asn
                               130                              135                              140
Leu Cys Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Ala Ser
145                               150                               155

```

<210> 173

<211> 1265

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(1265)

<223> n = A,T,C or G

<400> 173

```

ggcagcccgc actcgcagcc ctggcaggcg gcactgggtca tggaaaacga attgttctgc      60
tcgggcgctcc tgggtcatcc gcagtgggtg ctgtcagccg cacactgttt ccagaactcc      120
tacaccatcg ggctgggcct gcacagtctt gaggccgacc aagagccagg gagccagatg      180
gtggaggcca gcctctccgt acggcaccca gagtacaaca gaccttgct cgctaacgac      240
ctcatgtctca tcaagttgga cgaatccgtg tccgagtctg acaccatccg gagcatcagc      300
attgcttcgc agtgcctac cgcggggaac tcttgccctg tttctggctg ggggtctgctg      360
gcgaacgggtg agtcacggg tgtgtgtctg ccctcttcaa ggaggtcctc tgcccagtcg      420
cgggggctga cccagagctc tgcgtcccag gcagaatgcc taccgtgctg cagtgcgtga      480
acgtgtcggg ggtgtctgag gaggtctgca gtaagctcta tgaccgcctg taccaccca      540
gcatgttctg cgccggcgga gggcaagacc agaaggactc ctgcaacggg gactctgggg      600
ggccccctgat ctgcaacggg tacttgacagg gccttggtgtc tttcggaaaa gccccgtgtg      660
gccaaagtgg cgtgccagggt gtctacacca acctctgcaa attcactgag tggatagaga      720
aaaccgtcca ggccagttaa ctctggggac tgggaaccca tgaaattgac ccccaaatac      780
atcctgcgga aggaattcag gaatatctgt tcccagcccc tcctccctca ggcccaggag      840
tccaggcccc cagccccctc tcctcaaac caagggtaca gatccccagc ccctcctccc      900
tcagaccagc gagtcagac cccccagccc ctctccctc agaccagga gtccagcccc      960
tcctcctca gaccaggag tccagacccc ccagcccctc ctccctcaga cccaggggtt     1020
gaggccccca acccctcctc cttcagagtc agagggtcaa gcccacaacc cctcgttccc     1080
cagaccacaga ggttnagggt ccagcccctc ttcctcaga cccagnnggt caatgccacc     1140
tagattttcc ctgnacacag tgcccccttg tggngangttg acccaacctt accagttggt     1200
ttttcatttt tngtcccttt ccctagatc cagaaataaa gtttaagaga ngngcaaaaa     1260
aaaaa                                         1265

```

<210> 174

<211> 1459

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(1459)

<223> n = A,T,C or G

<400> 174

```

ggtcagccgc acactgtttc cagaagtgag tgcagagctc ctacaccatc gggctgggcc      60
tgcacagtct tggagccgac caagagccag ggagccagat ggtggaggcc agcctctccg      120
tacggcaccac agagtacaac agacccttgc tcgctaacga cctcatgctc atcaagttgg      180
acgaatccgt gtccgagtct gacaccatcc ggagcatcag cattgcttcg cagtgcccta      240
ccgcggggaa ctcttgccctc gtttctggct ggggtctgct ggcgaacggg gagctcacgg      300
gtgtgtgtct gccctcttca aggaggtcct ctgcccagtc gcgggggctg acccagagct      360
ctgctgccca ggcagaatgc ctaccgtgct gcagtgcgtg aacgtgtcgg tgggtgtctga      420
ngaggtctgc antaagctct atgacccgct gtaccacccc ancatgttct gcgccggcgg      480
agggcaagac cagaaggact cctgcaacgt gagagagggg aaaggggagg gcaggcgact      540
caggggaagg tggagaaggg ggagacagag acacacaggg ccgcatggcg agatgcagag      600
atggagagac acacagggag acagtgacaa ctagagagag aaactgagag aaacagagaa      660
ataaacacag gaataaagag aagcaaagga agagagaaac agaaacagac atggggaggc      720
agaaacacac acacatagaa atgcagttga ccttccaaca gcatggggcc tgagggcggg      780
gacctccacc caatagaaaa tcctcttata acttttgact ccccaaaaac ctgactagaa      840
atagcctact gttgacgggg agccttacca ataacataaa tagtcgattt atgcatacgt      900
tttatgcatt catgatatac ctttgttgga attttttgat atttctaagc tacacagttc      960
gtctgtgaat ttttttaaat tgttgcaact ctccataaat ttttctgatg tgtttattga     1020
aaaaatccaa gtataagtgg acttgtgcat tcaaaccagg gttgttcaag ggtcaactgt     1080
gtacccagag ggaaacagtg acacagattc atagaggtga aacacgaaga gaaacaggaa     1140
aatcaagac tctacaaaga ggctgggcag ggtggctcat gcctgtaatc ccagcacttt     1200
gggaggcgag gcaggcagat cacttgaggt aaggagttca agaccagcct ggccaaaatg     1260
gtgaaatcct gtctgtacta aaaatacaaa agttagctgg atatggtggc aggcgcctgt     1320
aatcccagct acttgggagg ctgaggcagg agaattgctt gaatatggga ggcagaggtt     1380
gaagtgaagt gagatcacac cactatactc cagctggggc aacagagtaa gactctgtct     1440
caaaaaaaaa aaaaaaaaaa

```

<210> 175

<211> 1167

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (1167)

<223> n = A,T,C or G

<400> 175

```

gcgcagccct ggcaggcggc actggctcatg gaaaacgaat tgttctgctc gggcgctcctg      60
gtgcatccgc agtgggtgct gtcagccgca cactgtttcc agaactccta caccatcggg      120
ctgggcctgc acagtcttga ggccgaccaa gagccaggga gccagatggt ggaggccagc      180
ctctccgtac ggcacccaga gtacaacaga ctcttgctcg ctaacgacct catgctcatc      240
aagttggacg aatccgtgtc cgagtctgac accatccgga gcatcagcat tgcttcgcag      300
tgccctaccg cggggaactc ttgcctcgtn tctggctggg gtctgctggc gaacggcaga      360
atgcctaccg tgctgactg cgtgaacgtg tcggtggtgt ctgaggangt ctgcagtaag      420
ctctatgacc cgctgtacca cccagcatg ttctgcgccg gcggagggca agaccagaag      480
gactcctgca acggtgactc tggggggccc ctgactgca acgggtactt gcagggcctt      540
gtgtctttcg gaaaagcccc gtgtggccaa cttggcgtgc caggtgtcta caccaacctc      600
tgcaaatca ctgagtggat agagaaaacc gtccagncca gtttaactctg gggactggga      660
acccatgaaa ttgaccccc aatacatcct gcggaangaa ttcaggaata tctgttccca      720
gcccctctc cctcaggccc aggagtccag gccccagcc cctcctccct caaaccaagg      780
gtacagatcc ccagcccctc ctccctcaga cccaggagtc cagaccccc agcccctcnt      840
cntcagacc caggagtcca gcccctctc cntcagacgc aggagtccag acccccagc      900

```

```

centcntccg tcagacccag ggggtgcaggc ccccaacccc tentcentca gagtcagagg      960
tccaagcccc caaccctcg tccccagac ccagaggtnc aggtcccagc ccttcctccc      1020
tcagacccag cgggtccaatg ccacctagan tntcctgta cacagtgcc ccttggtggca      1080
ngttgacca accttaccag ttgggttttc attttttgtc cctttcccct agatccagaa      1140
ataaagtnta agagaagcgc aaaaaaa      1167

```

<210> 176
 <211> 205
 <212> PRT
 <213> Homo sapien

<220>
 <221> VARIANT
 <222> (1)...(205)
 <223> Xaa = Any Amino Acid

```

<400> 176
Met Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val His Pro Gln Trp
 1          5          10          15
Val Leu Ser Ala Ala His Cys Phe Gln Asn Ser Tyr Thr Ile Gly Leu
          20          25          30
Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Met Val
          35          40          45
Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Leu Leu Leu
          50          55          60
Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu Ser
          65          70          75          80
Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala Gly
          85          90          95
Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly Arg Met
          100          105          110
Pro Thr Val Leu His Cys Val Asn Val Ser Val Val Ser Glu Xaa Val
          115          120          125
Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe Cys Ala
          130          135          140
Gly Gly Gly Gln Asp Gln Lys Asp Ser Cys Asn Gly Asp Ser Gly Gly
          145          150          155          160
Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe Gly Lys
          165          170          175
Ala Pro Cys Gly Gln Leu Gly Val Pro Gly Val Tyr Thr Asn Leu Cys
          180          185          190
Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Xaa Ser
          195          200          205

```

<210> 177
 <211> 1119
 <212> DNA
 <213> Homo sapien

```

<400> 177
gcgcactcgc agccctggca ggcggcactg gtcattggaaa acgaattggt ctgctcgggc      60
gtcctgggtgc atccgcagtg ggtgctgtca gccgcacact gtttccagaa ctcctacacc      120
atcgggctgg gcctgcacag tcttgaggcc gaccaagagc cagggagcca gatgggtggag      180
gccagcctct ccgtacggca cccagagtac aacagaccct tgctcgctaa cgacctcatg      240
ctcatcaagt tggacgaatc cgtgtccgag tctgacacca tccggagcat cagcattgct      300

```

```

tcgcagtgcc ctaccgcggg gaactcttgc ctcgtttctg gctggggtct gctggcgaaac 360
gatgctgtga ttgccatcca gtcccagact gtgggaggct gggagtgtga gaagctttcc 420
caaccctggc agggttgtac catttcggca acttcagtg caaggacgtc ctgctgcatc 480
ctcactgggt gctcactact gctcactgca tcaccggaa cactgtgatc aactagccag 540
caccatagtt ctccgaagtc agactatcat gattactgtg ttgactgtgc tgtctattgt 600
actaaccatg ccgatgttta ggtgaaatta gcgtcacttg gcctcaacca tcttggtatc 660
cagttatcct cactgaattg agatttcctg cttcagtgtc agccattccc acataatttc 720
tgacctacag aggtgaggga tcatatagct cttcaaggat gctggtactc ccctcacaaa 780
ttcatttctc ctggtttagt gaaagggtgcg ccctctggag cctcccaggg tgggtgtgca 840
ggtcacaatg atgaatgtat gatcgtgttc ccattaccca aagcctttaa atccctcatg 900
ctcagtacac cagggcaggt ctagcatttc ttcatttagt gtatgctgtc cattcatgca 960
accacctcag gactcctgga ttctctgcct agttgagctc ctgcatgctg cctccttggg 1020
gaggtgaggg agagggccca tggttcaatg ggatctgtgc agttgtaaca cattaggtgc 1080
ttaataaaca gaagctgtga tgtaaaaaa aaaaaaaaa 1119

```

<210> 178

<211> 164

<212> PRT

<213> Homo sapien

<220>

<221> VARIANT

<222> (1) ... (164)

<223> Xaa = Any Amino Acid

<400> 178

```

Met Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val His Pro Gln Trp
 1           5           10           15
Val Leu Ser Ala Ala His Cys Phe Gln Asn Ser Tyr Thr Ile Gly Leu
          20          25          30
Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Met Val
          35          40          45
Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu Leu
          50          55          60
Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu Ser
65          70          75          80
Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala Gly
          85          90          95
Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Asp Ala Val
          100         105         110
Ile Ala Ile Gln Ser Xaa Thr Val Gly Gly Trp Glu Cys Glu Lys Leu
          115         120         125
Ser Gln Pro Trp Gln Gly Cys Thr Ile Ser Ala Thr Ser Ser Ala Arg
          130         135         140
Thr Ser Cys Cys Ile Leu Thr Gly Cys Ser Leu Leu Leu Thr Ala Ser
145         150         155         160
Pro Gly Thr Leu

```

<210> 179

<211> 250

<212> DNA

<213> Homo sapien

<400> 179

| | |
|--|-----|
| ctggagtgcc ttggtgtttc aagccccctgc aggaagcaga atgcaccttc tgaggcacct | 60 |
| ccagctgccc ccggccgggg gatgagaggc tcggagcacc cttgcccggc tgtgattgct | 120 |
| gccaggcact gttcatctca gcttttctgt ccctttgctc ccggcaagcg cttctgctga | 180 |
| aagttcatat ctggagcctg atgtcttaac gaataaaggc cccatgctcc acccgaaaaa | 240 |
| aaaaaaaaaa | 250 |

<210> 180

<211> 202

<212> DNA

<213> Homo sapien

<400> 180

| | |
|--|-----|
| actagtcag tgtggtggaa ttccattgtg ttgggcccac cacaatggct acctttaaca | 60 |
| tcaccagac ccgcccctg ccggtgcccc acgctgctgc taacgacagt atgatgctta | 120 |
| ctctgtact cggaactat ttttatgtaa ttaatgtatg ctttcttggt tataaatgcc | 180 |
| tgatttaaaa aaaaaaaaaa aa | 202 |

<210> 181

<211> 558

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(558)

<223> n = A,T,C or G

<400> 181

| | |
|---|-----|
| tccytgtgt naggtttkkg agacamccck agacctwaan ctgtgtcaca gacttcyngg | 60 |
| aatgtttagg cagtgttagt aatttcytcg taatgattct gttattactt tcctnattct | 120 |
| ttattcctct ttcttctgaa gattaatgaa gttgaaaatt gaggtggata aatacaaaaa | 180 |
| ggtagtgtga tagtataagt atctaagtc agatgaaagt gtgttatata tatccattca | 240 |
| aaattatgca agttagtaat tactcagggt taactaaatt actttaatat gctgttgaa | 300 |
| ctactctgtt ccttggttag aaaaaattat aaacaggact ttgttagttt gggaagccaa | 360 |
| attgataata ttctatgttc taaaagtgg gctatacata aattattaag aaatatggaw | 420 |
| ttttattccc aggaatatgg kgttcatctt atgaatatta cscrggatag awgtwtgagt | 480 |
| aaaaycagtt ttggtwaata ygtwaatatg tcmtaaataa acaakgcttt gacttatttc | 540 |
| caaaaaaaaa aaaaaaaa | 558 |

<210> 182

<211> 479

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(479)

<223> n = A,T,C or G

<400> 182

| | |
|---|-----|
| acagggttk grggatgcta agsccccrga rwtggttga tccaaccctg gcttwttttc | 60 |
| agaggggaaa atggggccta gaagttacag mscatytagy tgggtgcgmg gcacccctgg | 120 |
| cstcacacag astcccagat agctgggact acaggcacac agtcactgaa gcaggccctg | 180 |
| ttwgcaattc acgttgccac ctccaactta aacattcttc atatgtgatg tccttagtca | 240 |
| ctaagggttaa actttccac ccagaaaagg caacttagat aaaatcttag agtactttca | 300 |

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| tactmttcta | agtcctcttc | cagcctcact | kkgagtcctm | cytggggggt | gataggaant | 360 |
| ntctcttggc | tttctcaata | aartctctat | ycatctcatg | tttaatttgg | tacgcatara | 420 |
| awtgstgara | aaattaaaaa | gttctgggty | macttttaaa | araaaaaaaa | aaaaaaaaa | 479 |

<210> 183

<211> 384

<212> DNA

<213> Homo sapien

<400> 183

| | | | | | | |
|------------|------------|------------|------------|------------|-------------|-----|
| aggcgggagc | agaagctaaa | gccaaagccc | aagaagagtg | gcagtgccag | cactgggtgcc | 60 |
| agtaccagta | ccaataacag | tgccagtgcc | agtgccagca | ccagtgggtg | cttcagtgtc | 120 |
| ggtgccagcc | tgaccgccac | tctcacattt | gggtctcttc | ctggccttgg | tggagctggt | 180 |
| gccagcacca | gtggcagctc | tggtgcctgt | ggtttctcct | acaagtgaga | ttttagatat | 240 |
| tgtaatacct | gccagtcttt | ctcttcaagc | cagggtgcat | cctcagaaac | ctactcaaca | 300 |
| cagcactcta | ggcagccact | atcaatcaat | tgaagttgac | actctgcatt | aratctattt | 360 |
| gccatttcaa | aaaaaaaaaa | aaaa | | | | 384 |

<210> 184

<211> 496

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(496)

<223> n = A,T,C or G

<400> 184

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| accgaattgg | gaccgctggc | ttataagcga | tcattgtynt | ccrgtatcac | ctcaacgagc | 60 |
| aggagatcgc | agtctatacg | ctgaagaaat | ttgaccgat | gggacaacag | acctgctcag | 120 |
| cccatcctgc | tcggttctcc | ccagatgaca | aatactctsg | acaccgaatc | accatcaaga | 180 |
| aacgcttcaa | ggtgctcatg | accagcaaac | cgcgcctgt | cctctgaggg | tcccttaaac | 240 |
| tgatgtcttt | tctgccacct | gttacccttc | ggagactccg | taaccaaact | cttcggactg | 300 |
| tgagccctga | tgcctttttg | ccagccatac | tctttggcat | ccagtctctc | gtggcgattg | 360 |
| attatgcttg | tgtgaggcaa | tcattggtgg | atcacccata | aagggaacac | atttgacttt | 420 |
| tttttctcat | attttaaatt | actacmagaw | tattwmagaw | waaatgawtt | gaaaaactst | 480 |
| taaaaaaaaa | aaaaaa | | | | | 496 |

<210> 185

<211> 384

<212> DNA

<213> Homo sapien

<400> 185

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| gctggtagcc | tatggcgkcg | cccacggagg | ggctcctgag | gccacggrac | agtgacttcc | 60 |
| caagtatcyt | gcgcsgcgtc | ttctaccgtc | cctacctgca | gatcttcggg | cagattcccc | 120 |
| aggaggacat | ggacgtggcc | ctcatggagc | acagcaactg | ytctgcggag | cccggcttct | 180 |
| gggcacaccc | tcctggggcc | caggcgggca | cctgcgtctc | ccagtatgcc | aactggctgg | 240 |
| tggtgctgct | cctcgctcat | ttcctgctcg | tggccaacat | cctgctggtc | aacttgctca | 300 |
| ttgccatgtt | cagttacaca | ttcggcaaa | tacagggcaa | cagcgatctc | tactgggaag | 360 |
| gcgcagcgtt | accgcctcat | ccgg | | | | 384 |

<210> 186

<211> 577

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (577)

<223> n = A,T,C or G

<400> 186

| | | | | | | |
|-------------|------------|------------|------------|------------|------------|-----|
| gagtttagctc | ctccacaacc | ttgatgaggt | cgtctgcagt | ggcctctcgc | ttcataccgc | 60 |
| tnccatcgctc | atactgtagg | tttgccacca | cytcctggca | tcttggggcg | gcntaatatt | 120 |
| ccaggaaact | ctcaatcaag | tcaccgtcga | tgaaacctgt | gggctgggtc | tgtcttcgcg | 180 |
| tcggtgtgaa | aggatctccc | agaaggagt | ctcgatcttc | cccacacttt | tgatgacttt | 240 |
| attgagtcga | ttctgcatgt | ccagcaggag | gttgtaccag | ctctctgaca | gtgaggtcac | 300 |
| cagccctatc | atgccgttga | mcgtgccgaa | garcaccgag | ccttggtgtg | gggkkgaggt | 360 |
| ctcaccacaga | ttctgcatta | ccagagagcc | gtggcaaaag | acattgacaa | actcgcccag | 420 |
| gtggaaaaag | amcamctcct | ggargtgctn | gccgctcttc | gtcmgttggt | ggcagcgctw | 480 |
| tccttttgac | acacaaacaa | gttaaaggca | ttttcagccc | ccagaaantt | gtcatcatcc | 540 |
| aagatntcgc | acagcactna | tccagttggg | attaat | | | 577 |

<210> 187

<211> 534

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (534)

<223> n = A,T,C or G

<400> 187

| | | | | | | |
|-------------|------------|------------|------------|------------|-------------|-----|
| aacatcttcc | tgtataatgc | tgtgtaatat | cgatccgatn | ttgtctgstg | agaatycatw | 60 |
| actkggaaaa | gmaacattaa | agcctggaca | ctggtattaa | aattcacaat | atgcaacact | 120 |
| ttaaacagtg | tgtcaatctg | ctcccyynac | tttgtcatca | ccagtctggg | aakaagggtg | 180 |
| tgccctattc | acacctgtta | aaaggcgct | aagcattttt | gattcaacat | cttttttttt | 240 |
| gacacaagtc | cgaaaaaagc | aaaagtatac | agttatyaat | ttgttagcca | attcactttc | 300 |
| ttcatgggac | agagccatyt | gatttaaaaa | gcaaattgca | taatattgag | cttygggagc | 360 |
| tgatatattga | gcggaagagt | agcctttcta | cttcaccaga | cacaactccc | tttcatattg | 420 |
| ggatgttnac | naaagtwatg | tctctwacag | atgggatgct | tttgtggcaa | ttctgtttctg | 480 |
| aggatctccc | agtttattta | ccacttgcac | aagaaggcgt | tttcttcctc | aggc | 534 |

<210> 188

<211> 761

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (761)

<223> n = A,T,C or G

<400> 188

| | | | | | | |
|------------|-------------|------------|------------|------------|-------------|-----|
| agaaaccagt | atctctnaaa | acaacctctc | ataccttggt | gacctaat | ttgtgtgcgtg | 60 |
| tgtgtgtgcg | cgcataattat | atagacaggg | acatcttttt | tacttttgta | aaagcttatg | 120 |
| cctctttggg | atctatatct | gtgaaagttt | taatgatctg | ccataatgtc | ttggggacct | 180 |

| | | | | | | |
|------------|-------------|------------|-------------|------------|------------|-----|
| ttgtcttctg | tgtaaatggt | actagagaaa | acacctatnt | tatgagtcaa | tctagttngt | 240 |
| tttattcgac | atgaaggaaa | tttccagatn | acaacactna | caaactctcc | ctkgackarg | 300 |
| ggggacaaag | aaaagcaaaa | ctgamcataa | raaacaatwa | cctggtgaga | arttgcataa | 360 |
| acagaaatwr | ggtagtatat | tgaarnacag | catcattaaa | rmgttwtktt | wttctccctt | 420 |
| gcaaaaaaca | tgtaacngact | tcccgttgag | taatgccaaag | ttgttttttt | tatnataaaa | 480 |
| cttgcccttc | attacatggt | tnaaagtggg | gtgggtggg | aaaatattga | aatgatggaa | 540 |
| ctgactgata | aagctgtaca | aataagcagt | gtgcctaaca | agcaacacag | taatgttgac | 600 |
| atgcttaatt | cacaaatgct | aatttcatta | taaatgtttg | ctaaaataca | ctttgaacta | 660 |
| tttttctgtn | ttcccagagc | tgagatntta | gattttatgt | agtatnaagt | gaaaaantac | 720 |
| gaaaataata | acattgaaga | aaaananaaa | aaanaaaaaa | a | | 761 |

<210> 189

<211> 482

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(482)

<223> n = A,T,C or G

<400> 189

| | | | | | | |
|------------|------------|------------|-------------|------------|------------|-----|
| tttttttttt | tttgccgatn | ctactatttt | attgcaggan | gtgggggtgt | atgcaccgca | 60 |
| caccgggggt | atnagaagca | agaaggaagg | agggagggga | cagccccttg | ctgagcaaca | 120 |
| aagccgcctg | ctgcctttct | tgtctgtctc | ctgggtgcagg | cacatgggga | gaccttcccc | 180 |
| aaggcagggg | ccaccagtcc | aggggtggga | atacaggggg | tgggangtgt | gcataagaag | 240 |
| tgataggcac | aggccacccg | gtacagaccc | ctcggtctct | gacaggtnga | tttcgaccag | 300 |
| gtcattgtgc | cctgcccagg | cacagcgtn | atctggaaaa | gacagaatgc | tttccctttc | 360 |
| aaatttggt | ngtcatngaa | ngggcanttt | tccaantng | gctnggtctt | ggtacncttg | 420 |
| gttcggccca | gtccncgtc | caaaaantat | tcaccnct | ccnaattgct | tgcnngnccc | 480 |
| cc | | | | | | 482 |

<210> 190

<211> 471

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(471)

<223> n = A,T,C or G

<400> 190

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| tttttttttt | ttttaaaaca | gtttttcaca | acaaaattta | ttagaagaat | agtggttttg | 60 |
| aaaactctcg | catccagtga | gaactaccat | acaccacatt | acagctngga | atgtnctcca | 120 |
| aatgtctggg | caaatgatac | aatggaacca | ttcaatctta | cacatgcacg | aaagaacaag | 180 |
| cgtttttgac | atacaatgca | caaaaaaaaa | aggggggggg | gaccacatgg | attaaaattt | 240 |
| taagtactca | tcacatacat | taagacacag | ttctagtcca | gtcnaaaatc | agaactgcnt | 300 |
| tgaaaaattt | catgtatgca | atccaaccaa | agaacttnat | tggtgatcat | gantnctcta | 360 |
| ctacatcnac | cttgatcatt | gccaggaacn | aaaagttnaa | ancacncngt | acaaaaanaa | 420 |
| tctgtaattn | anttcaacct | ccgtacngaa | aaatnttnnt | tatacactcc | c | 471 |

<210> 191

<211> 402

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(402)

<223> n = A,T,C or G

<400> 191

| | |
|---|-----|
| gagggattga aggtctgttc tastgtcggm ctgttcagcc accaactcta acaagttgct | 60 |
| gtcttccact cactgtctgt aagcttttta acccagacwg tatcttcata aatagaacaa | 120 |
| attcttcacc agtcacatct tctaggacct ttttggttc agttagtata agctcttcca | 180 |
| cttcctttgt taagacttca tctggtaaag tcttaagttt tgtagaaagg aattyaattg | 240 |
| ctcgttctct aacaatgtcc tctccttgaa gtatttggct gaacaacca cctaaagtcc | 300 |
| ctttgtgcat ccattttaaa tatacttaat agggcattgk tncactaggt taaattctgc | 360 |
| aagagtcatc tgtctgcaaa agttgcgtta gtatatctgc ca | 402 |

<210> 192

<211> 601

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(601)

<223> n = A,T,C or G

<400> 192

| | |
|---|-----|
| gagctcggat ccaataatct ttgtctgagg gcagcacaca tatncagtgc catggnaact | 60 |
| ggtctacccc acatgggagc agcatgccgt agntatataa ggctattccc tgagtcagac | 120 |
| atgcytyttt gaytaccgtg tgccaagtgc tgggtattct yaacacacyt ccatcccggt | 180 |
| cttttgtgga aaaactggca cttktctgga actagcarga catcacttac aaattcaccc | 240 |
| acgagacact tgaaagggtg aacaaagcga ytcttgcatt gctttttgtc cctccggcac | 300 |
| cagttgtcaa tactaaccgg ctggtttgcc tccatcacat ttgtgatctg tagctctgga | 360 |
| tacatctcct gacagtactg aagaacttct tcttttgttt caaaagcarg tcttggtgcc | 420 |
| tggtggatca gggtccatt tcccagtcyg aatgttcaca tggcatattt wacttccac | 480 |
| aaaacattgc gatttgaggc tcagcaacag caaatcctgt tccggcattg gctgcaagag | 540 |
| cctcgatgta gccggccagc gccaaaggcag gcgccgtgag cccaccagc agcagaagca | 600 |
| g | 601 |

<210> 193

<211> 608

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(608)

<223> n = A,T,C or G

<400> 193

| | |
|--|-----|
| atacagccca nateccacca cgaagatgcg cttgttgact gagaacctga tgcggtcact | 60 |
| gggtccgctg tagcccccagc gactctccac ctgctggaag cggttgatgc tgcactcytt | 120 |
| cccaacgcag gcagmagcgg gscgggtcaa tgaactccay tctgtggcttg gggtkgacgg | 180 |
| tkaagtgcag gaagaggctg accacctcgc ggtccaccag gatgcccagc tgtgcgggac | 240 |
| ctgcagcgaa actcctcgat ggcatgagc gggaaagcgaa tgaggcccag ggccttgccc | 300 |

| | | | | | | |
|------------|------------|-------------|-------------|------------|-------------|-----|
| agaaccttcc | gcctgttctc | tggcgtcacc | tgcagctgct | gccgctgaca | ctcggcctcg | 360 |
| gaccagcgga | caaacggcrt | tgaacagccg | cacctcacgg | atgccagtg | tgctcgctc | 420 |
| caggammgsc | accagcgtgt | ccagggtcaat | gtcgggtgaag | ccctccgcgg | gtratggcgt | 480 |
| ctgcagtgtt | tttgtcgatg | ttctccaggc | acaggctggc | cagctgcgg | tcatcgaaga | 540 |
| gtcgcgcctg | cgtgagcagc | atgaaggcgt | tgctggctcg | cagttcttct | tcaggaaactc | 600 |
| cacgcaat | | | | | | 608 |

<210> 194

<211> 392

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(392)

<223> n = A,T,C or G

<400> 194

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| gaacggctgg | accttgctc | gcattgtgct | tgctggcagg | gaataccttg | gcaagcagyt | 60 |
| ccagtccgag | cagccccaga | ccgtgcccgc | ccgaagctaa | gcctgcctct | ggccttcccc | 120 |
| tccgcctcaa | tgcagaacca | gtagtgggag | caactgtgtt | agagttaaga | gtgaacactg | 180 |
| tttgatttta | cttggaatt | tcctctgtta | tatagctttt | cccaatgcta | atttccaaac | 240 |
| aacaacaaca | aaataacatg | tttgctgtt | aagttgtata | aaagtaggtg | attctgtatt | 300 |
| taaagaaaat | attactgtta | catatactgc | ttgcaatttc | tgtatttatt | gktnctstgg | 360 |
| aaataaatat | agttattaaa | ggttgtcant | cc | | | 392 |

<210> 195

<211> 502

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(502)

<223> n = A,T,C or G

<400> 195

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| ccsttkgagg | ggtkaggkyc | cagttyccga | gtggaagaaa | caggccagga | gaagtgcgtg | 60 |
| ccgagctgag | gcagatgttc | ccacagtgc | ccccagagcc | stgggstata | gtytctgacc | 120 |
| cctcncaagg | aaagaccacs | ttctggggac | atgggctgga | gggcaggacc | tagaggcacc | 180 |
| aagggaaggc | cccattccgg | ggstgttccc | cgaggaggaa | gggaaggggc | tctgtgtgcc | 240 |
| ccccasgagg | aagaggccct | gagtcctggg | atcagacacc | ccttcacgtg | tatccccaca | 300 |
| caaatgcaag | ctcaccaagg | tccctctca | gtcccttcc | stacaccctg | amcgccact | 360 |
| gscscacacc | caccagagc | acgccaccg | ccatggggar | tgtgctcaag | gartcgcnng | 420 |
| gcarcgtgga | catctngtcc | cagaaggggg | cagaatctcc | aatagangga | ctgarcmstt | 480 |
| gctnanaaaa | aaaaanaaaa | aa | | | | 502 |

<210> 196

<211> 665

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(665)

<223> n = A,T,C or G

<400> 196

```

ggttacttgg tttcattgcc accacttagt ggatgtcatt tagaaccatt ttgtctgctc      60
cctctggaag ccttgccgag agcggacttt gtaattgttg gagaataact gctgaatttt      120
wagctgtttk gagttgatts gcaccactgc acccacaact tcaatatgaa aacyawttga      180
actwatttat tatcttgtga aaagtataac aatgaaaatt ttgttcatac tgtattkatc      240
aagtatgatg aaaagcaawa gatatatatt cttttattat gttaaattat gattgccatt      300
attaatcggc aaaatgtgga gtgtatgttc ttttcacagt aatatatgcc ttttgtaact      360
tcacttgggt attttattgt aaatgartta caaaattctt aatttaagar aatgggatgt      420
watatttatt tcattaatatt ctttcctkgt ttacgtwaat tttgaaaaga wtgcatgatt      480
tcttgacaga aatcgatctt gatgctgtgg aagtagtttg acccacatcc ctatgagttt      540
ttcttagaat gtataaagggt tgtagcccat cnaacttcaa agaaaaaaat gaccacatac      600
tttgcaatca ggctgaaatg tggcatgctn ttctaattcc aactttataa actagcaaan      660
aagtg                                           665

```

<210> 197

<211> 492

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(492)

<223> n = A,T,C or G

<400> 197

```

tttntttttt ttttttttgc aggaaggatt ccatttattg tggatgcatt ttcacaatat      60
atgtttattg gagcgatcca ttatcagtga aaagtatcaa gtgtttataa natttttagg      120
aaggcagatt cacagaacat gctngtcngc ttgcagtttt acctcgtana gatnacagag      180
aatttatagtc naaccagtaa acnaggaatt tacttttcaa aagattaaat ccaaactgaa      240
caaaattcta ccttgaaact tactccatcc aaatattgga ataanagtca gcagtgatcc      300
attctcttct gaactttaga ttttctagaa aaatatgtaa tagtgatcag gaagagctct      360
tgttcaaaag tacaacnaag caatgttccc ttaccatagg ccttaattca aactttgatc      420
catttcactc ccatcacggg agtcaatgct acctggggaca cttgtatttt gttcatnctg      480
ancntggctt aa                                           492

```

<210> 198

<211> 478

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(478)

<223> n = A,T,C or G

<400> 198

```

tttnttttgn atttcantct gtannaanta ttttcattat gtttattana aaaatatnaa      60
tgtntccacn acaaatcatn ttacntnagt aagaggccan ctacattgta caacatacac      120
tgagtatatt ttgaaaagga caagttttaa gtanacncat attgccganc atancacatt      180
tatacatggc ttgattgata tttagcacag canaaactga gtgagttacc agaaanaaat      240
natatatgtc aatcngatth aagatacaaa acagatccta tgggtacatan catcntgtag      300
gagttgtggc tttatgttta ctgaaagtca atgcagttcc tgtacaaaga gatggccgta      360
agcattctag tacctctact ccatgggtta gaatcgtaca cttatgttta catatgtncn      420

```

gggtaagaat tgtgttaagt naanttatgg agagggtccan gagaaaaatt tgatncaa 478

<210> 199

<211> 482

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(482)

<223> n = A,T,C or G

<400> 199

| | |
|--|-----|
| agtgacttgt cctccaacaa aacccttga tcaagtttgt ggcactgaca atcagaccta | 60 |
| tgctagtcc tgctacttat tcgtactaa atgcagactg gaggggacca aaaaggggca | 120 |
| tcaactccag ctggattatt ttggagcctg caaatctatt cctacttgta cggactttga | 180 |
| agtgattcag tttcctctac ggatgagaga ctggctcaag aatatacctca tgcagcttta | 240 |
| tgaagccnac tctgaacacg ctggttatct nagatgagaa ncagagaaat aaagtcnaga | 300 |
| aaatttacct ggangaaaag aggccttngg ctggggacca tcccattgaa ccttctctta | 360 |
| anggacttta agaanaaact accacatgtn tgtngtatcc tgggtgccngg ccgtttantg | 420 |
| aacntngacn ncacccttnt ggaatanant cttgaacngn tcctgaactt gtcctctgc | 480 |
| ga | 482 |

<210> 200

<211> 270

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(270)

<223> n = A,T,C or G

<400> 200

| | |
|---|-----|
| cggccgcaag tgcaactcca gctggggccg tgccggacgaa gattctgccca gcagttgggc | 60 |
| cgactgcgac gacggcggcg gcgacagtcg caggtgcagc gcggggcgct ggggtcttgc | 120 |
| aaggctgagc tgacgccgca gaggtcgtgt caggtccac gacctgacg ccgtcgggga | 180 |
| cagccggaac agagcccggg gaangcggga ggcctcgggg agcccctcgg gaagggcggc | 240 |
| ccgagagata cgcaggtgca ggtggccgcc | 270 |

<210> 201

<211> 419

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(419)

<223> n = A,T,C or G

<400> 201

| | |
|---|-----|
| tttttttttt ttttgaatc tactgcgagc acagcaggtc agcaacaagt ttattttgca | 60 |
| gctagcaagg taacagggtg gggcatgggt acatgttcag gtcaacttcc tttgtcgtgg | 120 |
| ttgattgggt tgtctttatg ggggcggggg ggggtagggg aaancgaagc anaantaaca | 180 |
| tggagtgggt gcaccctccc tgtagaacct gggtacnaaa gcttggggca gttcacctgg | 240 |

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| tctgtgaccg | tcattttctt | gacatcaatg | ttattagaag | tcaggatata | ttttagagag | 300 |
| tccactgtnt | ctggaggag | attaggggtt | cttgccaana | tccaancaa | atccacntga | 360 |
| aaaagttgga | tgatncangt | acngaatacc | ganggcatan | ttctcatant | cggaggcca | 419 |

<210> 202

<211> 509

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(509)

<223> n = A,T,C or G

<400> 202

| | | | | | | |
|------------|------------|-------------|-------------|------------|------------|-----|
| ttnttttttt | tttttttttt | tttttttttt | tttttttttt | tttttttttt | tttttttttt | 60 |
| tggaacttaa | tccattttta | tttcaaaatg | tctacaaant | ttnaatncnc | cattatacng | 120 |
| gtnattttnc | aaaatctaaa | nntttattcaa | atntnagcca | aantcettac | ncaaatnnaa | 180 |
| tacncncaa | aatcaaaaat | atacntntct | ttcagcaaac | ttngttacat | aaattaaaaa | 240 |
| aatatatacg | gctgggtgtt | tcaaagtaca | attatcttaa | cactgcaaac | atnttttnaa | 300 |
| ggaactaaaa | taaaaaaaaa | cactnccgca | aagggttaaag | ggaacaacaa | attcntttta | 360 |
| caacancnnc | nattataaaa | atcatatctc | aaatcttagg | ggaatatata | cttcacacng | 420 |
| ggatcttaac | ttttactnca | ctttgtttat | ttttttanaa | ccattgtntt | gggccaaca | 480 |
| caatggnaat | nccnccncc | tggaactagt | | | | 509 |

<210> 203

<211> 583

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(583)

<223> n = A,T,C or G

<400> 203

| | | | | | | |
|-------------|------------|------------|-------------|------------|-------------|-----|
| tttttttttt | ttttttttga | ccccctctt | ataaaaaaca | agttaccatt | ttattttact | 60 |
| tacacatatt | tattttataa | ttggtattag | atattcaaaa | ggcagctttt | aaaatcaaac | 120 |
| taaatggaaa | ctgccttaga | tacataattc | ttaggaatta | gcttaaaatc | tgccataaag | 180 |
| gaaaatcttc | tctagctctt | ttgactgtaa | atttttgact | cttgtaaaac | atccaaattc | 240 |
| atttttcttg | tctttaaaat | tatctaattc | ttccattttt | tccttattcc | aagtcaattt | 300 |
| gcttctctag | cctcatttcc | tagctcttat | ctactattag | taagtggctt | ttttcctaaa | 360 |
| agggaaaaca | ggaagagana | atggcacaca | aaacaaacat | tttatattca | tattttctacc | 420 |
| tacgttaata | aaatagcatt | ttgtgaagcc | agctcaaaaag | aaggcttaga | tccttttatg | 480 |
| tccatttttag | tcactaaacg | atatchnaag | tgccagaatg | caaaagggtt | gtgaacattt | 540 |
| attcaaaagc | taatataaga | tatttcacat | actcatcttt | ctg | | 583 |

<210> 204

<211> 589

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(589)

<223> n = A,T,C or G

<400> 204

| | | | | | | |
|------------|-------------|------------|------------|------------|-------------|-----|
| ttttttttnt | tttttttttt | tttttttctc | ttcttttttt | ttganaatga | ggatcgagtt | 60 |
| tttactcttc | tagatagggc | atgaagaaaa | ctcatctttc | cagctttaaa | ataacaatca | 120 |
| aatctcttat | gctatatcat | attttaagtt | aaactaatga | gtcactggct | tatcttctcc | 180 |
| tgaaggaaat | ctgttcattc | ttctcattca | tatagttata | tcaagtacta | ccttgcatat | 240 |
| tgagagggtt | ttcttctcta | tttacacata | tatttccatg | tgaatttgta | tcaaaccttt | 300 |
| attttcatgc | aaactagaaa | ataatgtntt | cttttgcata | agagaagaga | acaatatnag | 360 |
| cattacaaaa | ctgctcaaat | tgtttgtaa | gnttatccat | tataattagt | tnggcaggag | 420 |
| ctaatacaaa | tcacattttac | ngacnagcaa | taataaaact | gaagtaccag | ttaaataatcc | 480 |
| aaaataatta | aaggaacatt | tttagcctgg | gtataattag | ctaattcact | ttacaagcat | 540 |
| ttattnagaa | tgaattcaca | tgttattatt | ccntagccca | acacaatgg | | 589 |

<210> 205

<211> 545

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (545)

<223> n = A,T,C or G

<400> 205

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| ttttnttttt | ttttttcagt | aataatcaga | acaatattta | tttttatatt | taaaattcat | 60 |
| agaaaagtgc | cttacattta | ataaaagttt | gtttctcaaa | gtgatcagag | gaattagata | 120 |
| tngtcttgaa | caccaatatt | aatttgagga | aaatacacca | aaatacatta | agtaaattat | 180 |
| ttaagatcat | agagcttgta | agtgaaga | taaaatttga | cctcagaaac | tctgagcatt | 240 |
| aaaaatccac | tattagcaaa | taaattacta | tggacttctt | gctttaattt | tgtgatgaat | 300 |
| atgggggtgc | actggtaaac | caacacattc | tgaaggatac | attacttagt | gatagattct | 360 |
| tatgtacttt | gctanatnac | gtggatatga | gttgacaagt | ttctctttct | tcaatctttt | 420 |
| aaggggcnga | ngaaatgagg | aagaaaagaa | aaggattacg | catactgttc | tttctatngg | 480 |
| aaggattaga | tatgtttcct | ttgccaatat | taaaaaaata | ataatgttta | ctactagtga | 540 |
| aacc | | | | | | 545 |

<210> 206

<211> 487

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (487)

<223> n = A,T,C or G

<400> 206

| | | | | | | |
|-------------|-------------|------------|------------|------------|------------|-----|
| tttttttttt | tttttttagtc | aagtttctna | tttttattat | aattaaagtc | ttggtcattt | 60 |
| cattttattag | ctctgcaact | tacatattta | aattaaagaa | acgttnttag | acaactgtna | 120 |
| caatttataa | atgtaagggtg | ccattattga | gtanatatat | tcctccaaga | gtggatgtgt | 180 |
| cccttctccc | accaactaat | gaancagcaa | cattagttta | attttattag | tagatnatac | 240 |
| actgctgcaa | acgctaattc | tcttctccat | ccccatgtng | atattgtgta | tatgtgtgag | 300 |
| ttggtnagaa | tgcatacanca | atctnacaat | caacagcaag | atgaagctag | gcntgggctt | 360 |
| tcggtgaaaa | tagactgtgt | ctgtctgaat | caaataatct | gacctatcct | cggtggcaag | 420 |
| aactcttcga | accgcttcct | caaaggcngc | tgccacattt | gtggcntctn | ttgcacttgt | 480 |

ttcaaaa

487

<210> 207

<211> 332

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(332)

<223> n = A,T,C or G

<400> 207

| | | | | | | |
|------------|-------------|------------|------------|------------|------------|-----|
| tgaattggct | aaaagactgc | atTTTTanaa | ctagcaactc | ttatttcttt | cctttaaaaa | 60 |
| tacatagcat | taaattcccaa | atcctattta | aagacctgac | agcttgagaa | ggtcactact | 120 |
| gcatttatag | gaccttctgg | tggttctgct | gttacntttg | aantctgaca | atccttgana | 180 |
| atctttgcat | gcagaggagg | taaaaggtat | tggattttca | cagaggaana | acacagcgca | 240 |
| gaaatgaagg | ggccaggctt | actgagcttg | tccactggag | ggctcatggg | tgggacatgg | 300 |
| aaaagaaggc | agcctaggcc | ctggggagcc | ca | | | 332 |

<210> 208

<211> 524

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(524)

<223> n = A,T,C or G

<400> 208

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| agggcggtgg | gcgaggggcg | ttactgtttt | gtctcagtaa | caataaatac | aaaaagactg | 60 |
| gttggtgtcc | ggccccatcc | aaccacgaag | ttgatttctc | ttgtgtgcag | agtgactgat | 120 |
| tttaaaggac | atggagcttg | tcacaatgtc | acaatgtcac | agtgtgaagg | gcacactcac | 180 |
| tcccgcgtga | ttcacattta | gcaaccaaca | atagctcatg | agtccatact | tgtaaatact | 240 |
| tttggcagaa | tacttnttga | aacttgcaga | tgataactaa | gatccaagat | atttcccaaa | 300 |
| gtaaatagaa | gtgggtcata | atattaatta | cctgttcaca | tcagcttcca | tttacaagtc | 360 |
| atgagcccag | acactgacat | caaactaagc | ccacttagac | tcctcaccac | cagtctgtcc | 420 |
| tgtcatcaga | caggaggctg | tcaccttgac | caaattctca | ccagtcaatc | atctatccaa | 480 |
| aaaccattac | ctgatccact | tccggtaatg | caccaccttg | gtga | | 524 |

<210> 209

<211> 159

<212> DNA

<213> Homo sapien

<400> 209

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| gggtgaggaa | atccagagtt | gccatggaga | aaattccagt | gtcagcattc | ttgtccttg | 60 |
| tggcctctc | ctacactctg | gccagagata | ccacagtcaa | acctggagcc | aaaaaggaca | 120 |
| caaaggactc | tcgacccaaa | ctgccccaga | ccctctcca | | | 159 |

<210> 210

<211> 256

<212> DNA

<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(256)
<223> n = A,T,C or G

<400> 210
actccctggc agacaaaggc agaggagaga gctctgttag ttctgtgttg ttgaactgcc 60
actgaatttc tttccacttg gactattaca tgccanttga gggactaatg gaaaaacgta 120
tggggagatt ttanccaatt tangtntgta aatggggaga ctggggcagg cgggagagat 180
ttgcagggtg naaatgggan ggctggtttg ttanatgaac agggacatag gaggtaggca 240
ccaggatgct aaatca 256

<210> 211
<211> 264
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(264)
<223> n = A,T,C or G

<400> 211
acattgtttt tttagataa agcattgaga gagctctcct taacgtgaca caatggaagg 60
actggaacac ataccacat cttgttctg agggataatt ttctgataaa gtcttgctgt 120
atattcaagc acatatgtta tatattattc agttccatgt ttatagccta gttaaggaga 180
ggggagatac attcngaaag aggactgaaa gaaatactca agtnggaaaa cagaaaaaga 240
aaaaaaggag caaatgagaa gcct 264

<210> 212
<211> 328
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(328)
<223> n = A,T,C or G

<400> 212
acccaaaaat ccaatgctga atatttggct tcattattcc canattcttt gattgtcaaa 60
ggatttaatg ttgtctcagc ttgggcactt cagttaggac ctaaggatgc cagccggcag 120
gtttatatat gcagcaacaa tattcaagcg cgacaacagg ttattgaact tgcccgccag 180
ttnaatttca ttcccattga cttgggatcc ttatcatcag ccagagagat tgaaaattta 240
cccctacnac tctttactct ctgganaggg ccagtgggtg tagctataag cttggccaca 300
tttttttttc cttttattcct ttgtcaga 328

<210> 213
<211> 250
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature

<222> (1) ... (250)

<223> n = A,T,C or G

<400> 213

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| acttatgagc | agagcgacat | atccnagtgt | agactgaata | aaactgaatt | ctctccagtt | 60 |
| taaagcattg | ctcactgaag | ggatagaagt | gactgccagg | agggaaagta | agccaaggct | 120 |
| cattatgcca | aagganatat | acattttcaat | tctccaaact | tcttcctcat | tccaagagtt | 180 |
| ttcaatattt | gcatgaacct | gctgataanc | catgttaana | aacaaatata | tctctnacct | 240 |
| tctcatcggt | | | | | | 250 |

<210> 214

<211> 444

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (444)

<223> n = A,T,C or G

<400> 214

| | | | | | | |
|------------|-------------|------------|------------|------------|-------------|-----|
| accagaatc | caatgctgaa | tatttggtct | cattattccc | agattctttg | attgtcaaag | 60 |
| gatttaattg | tgtctcagct | tgggcacttc | agttaggacc | taaggatgcc | agccggcagg | 120 |
| tttatatatg | cagcaacaat | attcaagcgc | gacaacaggt | tattgaactt | gcccggcagg | 180 |
| tgaatttcat | tcccattgac | ttgggatcct | tatcatcagc | canagagatt | gaaaattttac | 240 |
| ccctacgact | ctttactctc | tggagagggc | cagtgggtgt | agctataagc | ttggccacat | 300 |
| ttttttttcc | tttattcctt | tgtcagagat | gcgattcatc | catatgctan | aaaccaacag | 360 |
| agtgactttt | acaaaattcc | tataganatt | gtgaataaaa | ccttacctat | agttgcccatt | 420 |
| actttgctct | ccctaataata | cctc | | | | 444 |

<210> 215

<211> 366

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (366)

<223> n = A,T,C or G

<400> 215

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| acttatgagc | agagcgacat | atccaagtgt | anactgaata | aaactgaatt | ctctccagtt | 60 |
| taaagcattg | ctcactgaag | ggatagaagt | gactgccagg | agggaaagta | agccaaggct | 120 |
| cattatgcca | aagganatat | acattttcaat | tctccaaact | tcttcctcat | tccaagagtt | 180 |
| ttcaatattt | gcatgaacct | gctgataagc | catgttgaga | aacaaatata | tctctgacct | 240 |
| tctcatcggt | aagcagaggg | tgtaggcaac | atggaccata | gcgaanaaaa | aacttagtaa | 300 |
| tccaagctgt | tttctacact | gtaaccagggt | ttccaaccaa | ggtggaaatc | tcctatactt | 360 |
| ggtgcc | | | | | | 366 |

<210> 216

<211> 260

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(260)

<223> n = A,T,C or G

<400> 216

| | |
|---|-----|
| ctgtataaac agaactccac tgcangaggg agggccgggc caggagaatc tccgcttgtc | 60 |
| caagacaggg gcctaaggag ggtctccaca ctgctnntaa gggctnttnc atttttttat | 120 |
| taataaaaag tnnaaaaggc ctcttctcaa cttttttccc ttnggctgga aaatttaaaa | 180 |
| atcaaaaatt tcctnaagtt ntcaagctat catatatact ntatcctgaa aaagcaacat | 240 |
| aattcttctt tccctccttt | 260 |

<210> 217

<211> 262

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(262)

<223> n = A,T,C or G

<400> 217

| | |
|---|-----|
| acctacgtgg gtaagtttan aaatgttata atttcaggaa naggaacgca tataattgta | 60 |
| tcttgcttat aattttctat ttttaataagg aaatagcaaa ttgggggtggg gggaatgtag | 120 |
| ggcattctac agtttgagca aaatgcaatt aaatgtggaa ggacagcact gaaaaatttt | 180 |
| atgaataatc tgatgatta tatgtctcta gagtagattt ataattagcc acttacccta | 240 |
| atataccttca tgcttgtaaa gt | 262 |

<210> 218

<211> 205

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(205)

<223> n = A,T,C or G

<400> 218

| | |
|--|-----|
| accaaggtgg tgcattaccg gaantggatc aangacacca tctgtggccaa cccctgagca | 60 |
| cccctatcaa ctcccttttg tagtaaaactt ggaaccttgg aaatgaccag gccaagactc | 120 |
| aggcctcccc agttctactg acctttgtcc ttangntna ngtccagggt tgctaggaaa | 180 |
| anaaatcagc agacacaggt gtaaa | 205 |

<210> 219

<211> 114

<212> DNA

<213> Homo sapien

<400> 219

| | |
|---|-----|
| tactgttttg tctcagtaac aataaatata aaaagactgg ttgtgttccg gccccatcca | 60 |
| accacgaagt tgatttctct tgtgtgcaga gtgactgatt tttaaaggaca tgga | 114 |

<210> 220

<211> 93

<212> DNA

<213> Homo sapien

<400> 220

| | |
|---|----|
| actagccagc acaaaaggca gggtagcctg aattgctttc tgctctttac atttctttta | 60 |
| aaataagcat ttagtgctca gtccctactg agt | 93 |

<210> 221

<211> 167

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(167)

<223> n = A,T,C or G

<400> 221

| | |
|---|-----|
| actangtgca ggtgcgca aatatttgtc gatattccct tcattcttga ttccatgagg | 60 |
| tcttttgccc agcctgtggc tctactgtag taagtttctg ctgatgagga gccagnatgc | 120 |
| ccccactac cttccctgac gctccccana aatcacccaa cctctgt | 167 |

<210> 222

<211> 351

<212> DNA

<213> Homo sapien

<400> 222

| | |
|---|-----|
| agggcggtggt gcgaggggcg gtactgacct cattagtagg aggatgcatt ctggcacc | 60 |
| gttcttcacc tgtcccccaa tccttaaaag gccatactgc ataaagtcaa caacagataa | 120 |
| atgtttgctg aattaaagga tggatgaaaa aaattaataa tgaatttttg cataatccaa | 180 |
| ttttctcttt tatatttcta gaagaagttt ctttgagcct attagatccc gggaatcttt | 240 |
| taggtgagca tgattagaga gcttgtaggt tgcttttaca tatatctggc atatttgagt | 300 |
| ctcgtatcaa aacaatagat tggtaaaggt ggtattattg tattgataag t | 351 |

<210> 223

<211> 383

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(383)

<223> n = A,T,C or G

<400> 223

| | |
|--|-----|
| aaaacaaaca aacaaaaaaa acaattcttc attcagaaaa attatcttag ggactgatat | 60 |
| tggttaattat ggtcaattta atwrtttkt ggggcatttc cttacattgt cttgacaaga | 120 |
| ttaaaatgtc tgtgccaaaa ttttgtattt tatttggaga cttcttatca aaagtaatgc | 180 |
| tgccaaagga agtctaagga attagtagtg ttcccmcac ttgtttggag tgtgctattc | 240 |
| taaaagattt tgatttcctg gaatgacaat tatattttta ctttgggtggg ggaaanagtt | 300 |
| ataggaccac agtcttcact tctgatactt gttaaattaat cttttattgc acttgttttg | 360 |
| accattaagc tatatgttta aaa | 383 |

<210> 224

<211> 320
 <212> DNA
 <213> Homo sapien

<400> 224
 cccctgaagg cttcttggtta gaaaatagta cagttacaac caataggaac aacaaaaaga 60
 aaaagtttgt gacattgttag tagggagtgt gtacccctta cccccatca aaaaaaaaaat 120
 ggatacatgg ttaaaggata raagggaat attttatcat atgttctaaa agagaaggaa 180
 gagaaaatac tactttctcr aaatggaagc ccttaaaggt gctttgatac tgaaggacac 240
 aaatgtggcc gtccatcctc ctttaragtt gcatgacttg gacacggtaa ctggtgcagt 300
 tttaractcm gcattgtgac 320

<210> 225
 <211> 1214
 <212> DNA
 <213> Homo sapien

<400> 225
 gaggactgca gccgcactc gcagccctgg caggcgccac tggctcatgga aaacgaattg 60
 ttctgctcgg gcgtcctggt gcaccccgag tgggtgctgt cagccgcaca ctgtttccag 120
 aactcctaca ccacgaggct gggcctgcac agtcttgagg ccgaccaaga gccagggagc 180
 cagatggtag agggcagcct ctccgtacgg caccagagt acaacagacc cttgctcgct 240
 aacgacctca tgctcatcaa gttggacgaa tccgtgtccg agtctgacac catccggagc 300
 atcagcattg cttcgagtg ccctaccgag ggggaactctt gcctcgtttc tggctggggg 360
 ctgctggcga acggcagaat gcctaccgtg ctgcagtgcg tgaacgtgtc ggtgggtgtc 420
 gaggagggtc gcagtaagct ctatgacccg ctgtaccacc ccagcatgtt ctgcgccggc 480
 ggaggggcaag accagaagga ctctgcaac ggtgactctg gggggccccct gatctgcaac 540
 gggtagttgc agggccttgt gtctttcgga aaagccccgt gtggccaagt tggcgtgcca 600
 ggtgtctaca ccaacctctg caaattcact gagtggatag agaaaaccgt ccaggccagt 660
 taactctggg gactgggaac ccattgaaat gacccccaaa tacatcctgc ggaaggaatt 720
 caggaatatc tgttcccagc ccctcctccc tcaggcccag gagtccaggc cccagcccc 780
 tcctccctca aaccaagggt acagatcccc agccccctct ccctcagacc caggagtcca 840
 gacccccag cccctcctcc ctccagacca ggagtccagc ccctcctccc tcagaccag 900
 gagtccagac ccccgagccc ctccctccctc agaccaggg gtccaggccc ccaaccctc 960
 ctccctcaga ctccagaggtc caagccccc accctcctt cccagagacc agaggtccag 1020
 gtccagagcc ctccctccctc agaccagcg gtccaatgcc acctagactc tccctgtaca 1080
 cagtgcctcc ttgtggcacg ttgacccaac cttaccagtt ggtttttcat tttttgtccc 1140
 tttcccttag atccagaaat aaagtctaag agaagcgcaa aaaaaaaaaa aaaaaaaaaa 1200
 aaaaaaaaaa aaaa 1214

<210> 226
 <211> 119
 <212> DNA
 <213> Homo sapien

<400> 226
 acccagtatg tgcagggaga cggaacccca tgtgacagcc cactccacca gggttcccaa 60
 agaacctggc ccagtcataa tcattcatcc tgacagtggc aataatcacg ataaccagt 119

<210> 227
 <211> 818
 <212> DNA
 <213> Homo sapien

<400> 227

| | | | | | | |
|-------------|------------|-------------|------------|-------------|------------|-----|
| acaattcata | gggacgacca | atgaggacag | ggaatgaacc | cggctctccc | ccagccctga | 60 |
| tttttgctac | atatggggtc | ccttttcatt | ctttgcaaaa | acactgggtt | ttctgagaac | 120 |
| acggacgggt | cttagcacia | tttgtgaaat | ctgtgtaraa | ccgggctttg | caggggagat | 180 |
| aattttcctc | ctctggagga | aaggtgggtg | ttgacaggca | gggagacagt | gacaaggcta | 240 |
| gagaaagcca | cgctcggcct | tctctgaacc | aggatggaac | ggcagacccc | tgaaaacgaa | 300 |
| gcttgctccc | ttccaatcag | ccactttctga | gaacccccat | ctaacttcct | actggaaaag | 360 |
| agggcctcct | caggagcagt | ccaagagttt | tcaaagataa | cgtgacaact | accatctaga | 420 |
| ggaaaggggtg | caccctcagc | agagaagccg | agagcttaac | tctggctcgtt | tccagagaca | 480 |
| acctgctggc | tgtcttggtg | tgcgcccagc | ctttgagagg | ccactacccc | atgaacttct | 540 |
| gccatccact | ggacatgaag | ctgaggacac | tgggcttcaa | cactgagttg | tcatgagagg | 600 |
| gacaggctct | gccctcaagc | cggctgaggg | cagcaaccac | tctcctcccc | tttctcacgc | 660 |
| aaagccattc | ccacaaatcc | agaccatacc | atgaagcaac | gagacccaaa | cagtttggtt | 720 |
| caagaggata | tgaggactgt | ctcagcctgg | ctttgggctg | acaccatgca | cacacacaag | 780 |
| gtccacttct | aggttttcag | cctagatggg | agtcgtgt | | | 818 |

<210> 228

<211> 744

<212> DNA

<213> Homo sapien

<400> 228

| | | | | | | |
|-------------|------------|-------------|------------|-------------|------------|-----|
| actggagaca | ctgttgaact | tgatcaagac | ccagaccacc | ccaggtctcc | ttcgtgggat | 60 |
| gtcatgacgt | ttgacatacc | tttggaaacga | gcctcctcct | tggaagatgg | aagaccgtgt | 120 |
| tcgtggcga | cctggcctct | cctggcctgt | ttcttaagat | gcggagtcac | atttcaatgg | 180 |
| taggaaaagt | ggcttcgtaa | aatagaagag | cagtcactgt | ggaactacca | aatggcgaga | 240 |
| tgctcgggtc | acattggggg | gctttgggat | aaaagattta | tgagccaact | attctctggc | 300 |
| accagattct | aggccagttt | gttccactga | agcttttccc | acagcagtc | acctctgcag | 360 |
| gctggcagct | gaatggcttg | ccgggtggctc | tgtggcaaga | tcacactgag | atcgatgggt | 420 |
| gagaaggcta | ggatgcttgt | ctagtgttct | tagctgtcac | gttggctcct | tccaggttgg | 480 |
| ccagacggtg | ttggccactc | ccttctaaaa | cacaggcgcc | ctcctgggtga | cagtgacccg | 540 |
| ccgtgggtatg | ccttggccca | ttccagcagt | cccagttatg | catttcaagt | ttggggtttg | 600 |
| ttcttttctg | taatgttcct | ctgtgttgtc | agctgtcttc | atttctctgg | ctaagcagca | 660 |
| ttgggagatg | tggaccagag | atccactcct | taagaaccag | tggcgaaaga | cactttcttt | 720 |
| cttactctg | aagtagctgg | tggt | | | | 744 |

<210> 229

<211> 300

<212> DNA

<213> Homo sapien

<400> 229

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| cgagtctggg | ttttgtctat | aaagtgtgat | ccctcctttt | ctcatccaaa | tcatgtgaac | 60 |
| cattacacat | cgaaataaaa | gaaaggtggc | agacttgccc | aacgccaggc | tgacatgtgc | 120 |
| tgcagggttg | ttgtttttta | attattattg | ttagaaacgt | caccacagt | ccctgttaat | 180 |
| ttgtatgtga | cagccaactc | tgagaaggtc | ctatttttcc | acctgcagag | gatccagtct | 240 |
| cactaggctc | ctccttgccc | tcacactgga | gtctccgcca | gtgtgggtgc | ccactgacat | 300 |

<210> 230

<211> 301

<212> DNA

<213> Homo sapien

<400> 230

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| cagcagaaca | aatacaata | tgaagagtgc | aaagatctca | taaaatctat | gctgaggaat | 60 |
| gagcgacagt | tcaaggagga | gaagcttgca | gagcagctca | agcaagctga | ggagctcagg | 120 |

| | |
|---|-----|
| caatataaag tcctggttca cactcaggaa cgagagctga cccagttaag ggagaagttg | 180 |
| cggaagggga gagatgcctc cctctcattg aatgagcatc tccaggccct cctcactccg | 240 |
| gatgaaccgg acaagtccca ggggcaggac ctccaagaaa cagacctcgg ccgcgaccac | 300 |
| g | 301 |

<210> 231

<211> 301

<212> DNA

<213> Homo sapien

<400> 231

| | |
|--|-----|
| gcaagcacgc tggcaaatct ctgtcaggtc agctccagag aagccattag tcatttttagc | 60 |
| caggaactcc aagtccacat ccttggaac tggggacttg cgcaggttag ccttgaggat | 120 |
| ggcaacacgg gacttctcat caggaagtgg gatgtagatg agctgatcaa gacggccagg | 180 |
| tctgaggatg gcaggatcaa tgatgtcagg ccggttggtg ccgccaatga tgaacacatt | 240 |
| tttttttgtg gacatgccat ccatttctgt caggatctgg ttgatgactc ggtcagcagc | 300 |
| c | 301 |

<210> 232

<211> 301

<212> DNA

<213> Homo sapien

<400> 232

| | |
|---|-----|
| agtaggtatt tcgtgagaag ttcaacacca aaactggaac atagtctctc ttcaagtgtt | 60 |
| ggcgacagcg ggccttcctg attctggaat ataactttgt gtaaattaac agccacctat | 120 |
| agaagagtcc atctgctgtg aaggagagac agagaactct ggggtccgtc gtcctgtcca | 180 |
| cgtgctgtac caagtgtgg tgccagcctg ttacctgttc tcaactgaaa tctggctaata | 240 |
| gctctgtgt atcacttctg attctgacaa tcaatcaatc aatggcctag agcactgact | 300 |
| g | 301 |

<210> 233

<211> 301

<212> DNA

<213> Homo sapien

<400> 233

| | |
|---|-----|
| atgactgact tccagtaag gctctctaag gggtaagtag gaggatccac aggatttgag | 60 |
| atgctaaggc cccagagatc gtttgatcca accctcttat ttccagaggg gaaaatgggg | 120 |
| cctagaagtt acagagcatc tagctggtgc gctggcacc cttggcctcac acagactccc | 180 |
| gagtagctgg gactacaggg acacagtcac tgaagcaggc cctgttagca attctatgag | 240 |
| tacaaattaa catgagatga gtagagactt tattgagaaa gcaagagaaa atcctatcaa | 300 |
| c | 301 |

<210> 234

<211> 301

<212> DNA

<213> Homo sapien

<400> 234

| | |
|---|-----|
| aggtectaca catcgagact catccatgat tgatatgaat ttaaaaatta caagcaaaga | 60 |
| cattttattc atcatgatgc tttcttttgt ttcttctttt cgttttcttc tttttctttt | 120 |
| tcaatttcag caacatactt ctcaafttct tcaggattta aaatcttgag ggattgatct | 180 |
| cgctcatga cagcaagttc aatgtttttg ccacctgact gaaccacttc caggagtgcc | 240 |
| ttgatcacca gcttaatggg cagatcatct gcttcaatgg cttcgtcagt atagttcttc | 300 |

t 301

<210> 235
 <211> 283
 <212> DNA
 <213> Homo sapien

<400> 235
 tggggctgtg catcaggcgg gtttgagaaa tattcaattc tcagcagaag ccagaatttg 60
 aattccctca tcttttaggg aatcatttac caggtttgga gaggattcag acagctcagg 120
 tgctttcact aatgtctctg aacttctgtc cctctttgtt catggatagt ccaataaata 180
 atgttatctt tgaactgatg ctcataggag agaataaag aactctgagt gatatcaaca 240
 ttagggattc aaagaaatat tagatttaag ctcacactgg tca 283

<210> 236
 <211> 301
 <212> DNA
 <213> Homo sapien

<400> 236
 aggtcctcca ccaactgcct gaagcacggg taaaattggg aagaagtata gtgcagcata 60
 aatactttta aatcgatcag atttccctaa cccacatgca atcttcttca ccagaagagg 120
 tcggagcagc atcattaata ccaagcagaa tgcgtaatag ataaatacaa tggatatag 180
 tgggtagacg gcttcatgag tacagtgtac tgtgggtatcg taatctggac ttgggttgta 240
 aagcatcgtg taccagtcag aaagcatcaa tactcgacat gaacgaatat aaagaacacc 300
 a 301

<210> 237
 <211> 301
 <212> DNA
 <213> Homo sapien

<400> 237
 cagtggtagt ggtgggtggac gtggcggttg tegtgggtgcc ttttttggtg cccgtcacaa 60
 actcaatttt tgttcgctcc tttttggcct tttccaattt gtccatctca attttctggg 120
 ccttggtctaa tgcctcatag taggagtcct cagaccagcc atggggatca aacatatact 180
 ttgggtagt ggtgccaagc tcgtcaatgg cacagaatgg atcagcttct cgtaaatcta 240
 gggttccgaa attctttctt cctttggata atgtagttca tatccattcc ctcttttatt 300
 t 301

<210> 238
 <211> 301
 <212> DNA
 <213> Homo sapien

<400> 238
 gggcagggtt tttttttttt ttttttgatg gtgcagaccc ttgctttatt tgtctgactt 60
 gttcacagtt cagccccctg ctccagaaaac caacgggcca gctaaggaga ggaggaggca 120
 ccttgagact tccggagtcg aggtctctca gggttcccca gcccatcaat cattttctgc 180
 accccctgcc tgggaagcag ctccctgggg ggtgggaatg ggtgactaga agggatttca 240
 gtgtgggacc cagggtctgt tcttcacagt aggaggtgga agggatgact aattttcttta 300
 t 301

<210> 239
 <211> 239

<212> DNA

<213> Homo sapien

<400> 239

| | |
|--|-----|
| ataagcagct aggggaattct ttatttagta atgtcctaac ataaaagttc acataactgc | 60 |
| ttctgtcaaa ccatgatact gagctttgtg acaaccaga aataactaag agaaggcaaa | 120 |
| cataatacct tagagatcaa gaaacattta cacagttcaa ctgtttaaaa atagctcaac | 180 |
| attcagccag tgagtagagt gtgaatgcc a gcatacacag tatacaggtc cttcagga | 239 |

<210> 240

<211> 300

<212> DNA

<213> Homo sapien

<400> 240

| | |
|---|-----|
| ggtcctaatag aagcagcagc ttccacattt taacgcaggt ttacgggtgat actgtccttt | 60 |
| gggatctgcc ctccagtgg aaccttttaag gaagaagtgg gcccaagcta agttccacat | 120 |
| gctgggtgag ccagatgact tctgttccct ggtcactttc ttcaatgggg cgaatggggg | 180 |
| ctgccaggtt tttaaaatca tgcttcatct tgaagcacac ggtcacttca cctcctcac | 240 |
| gctgtgggtg tactttgatg aaaataccca ctttgttggc ctttctgaag ctataatgtc | 300 |

<210> 241

<211> 301

<212> DNA

<213> Homo sapien

<400> 241

| | |
|---|-----|
| gaggtctggt gctgaggtct ctgggctagg aagaggagtt ctgtggagct ggaagccaga | 60 |
| cctcttttga ggaaactcca gcagctatgt tgggtgtctct gagggaaatgc aacaaggctg | 120 |
| ctcctccatg tattggaaaa ctgcaaaactg gactcaactg gaaggaagtg ctgctgccag | 180 |
| tgtgaagaac cagcctgagg tgacagaaac ggaagcaaac aggaacagcc agtcttttct | 240 |
| tcctcctct gtcatacggc ctctctcaag catcctttgt tgtcaggggc ctaaaaggga | 300 |
| g | 301 |

<210> 242

<211> 301

<212> DNA

<213> Homo sapien

<400> 242

| | |
|--|-----|
| ccgaggtcct gggatgcaac caatcactct gtttcacgtg acttttatca ccatacaatt | 60 |
| tgtggcattt cctcattttc tacattgtag aatcaagagt gtaaataaat gtatatcgat | 120 |
| gtcttcaaga atatatcatt cttttttcac tagaaccat tcaaaatata agtcaagaat | 180 |
| cttaatatca acaaatatat caagcaaact ggaaggcaga ataactacca taatttagta | 240 |
| taagtaccca aagttttata aatcaaaagc cctaatagata accattttta gaattcaatc | 300 |
| a | 301 |

<210> 243

<211> 301

<212> DNA

<213> Homo sapien

<400> 243

| | |
|---|-----|
| aggtaagtcc cagtttgaag ctcaaaagat ctggtatgag cataggctca tcgacgacat | 60 |
| ggtggcccaa gctatgaaat cagagggagg ctcatctgg gcctgtaaaa actatgatgg | 120 |

tgacgtgcag tcggactctg tggcccaagg gtatggctct ctccggcatga tgaccagcgt 180
 gctggtttgt ccagatggca agacagtaga agcagaggct gcccacggga ctgtaaccgc 240
 tcactaccgc atgttccaga aaggacagga gacgtccacc aatcccattg cttccatttt 300
 t 301

<210> 244

<211> 300

<212> DNA

<213> Homo sapien

<400> 244

gctggtttgc aagaatgaaa tgaatgattc tacagctagg acttaacctt gaaatggaaa 60
 gtcattgcaat cccatttgca ggatctgtct gtgcacatgc ctctgtagag agcagcattc 120
 ccagggacct tggaaacagt tgacactgta aggtgcttgc tccccaaagac acatccctaaa 180
 aggtgttgta atggtgaaaa cgtcttcctt ctttattgce ccttcttatt tatgtgaaca 240
 actgtttgtc ttttgtgtat cttttttaaa ctgtaaagtt caattgtgaa aatgaatatt 300

<210> 245

<211> 301

<212> DNA

<213> Homo sapien

<400> 245

gtctgagtat ttaaaatgtt attgaaatta tccccaacca atgttagaaa agaaagaggt 60
 tatatactta gataaaaaat gaggtgaatt actatccatt gaaatcatgc tcttagaatt 120
 aaggccagga gatattgtca ttaatgtara cttcaggaca ctagagtata gcagccctat 180
 gttttcaaag agcagagatg caattaaata ttgttttagca tcaaaaaggc cactcaatac 240
 agctaataaa atgaaagacc taatttctaa agcaattctt tataattttac aaagttttaa 300
 g 301

<210> 246

<211> 301

<212> DNA

<213> Homo sapien

<400> 246

ggtctgtcct acaatgcctg cttcttgaaa gaagtcggca ctttctagaa tagctaaata 60
 acctgggctt attttaaaga actatttgta gtcagattg gttttcctat ggctaaaata 120
 agtgcttctt gtgaaaatta aataaaacag ttaattcaaa gccttgatat atgttaccac 180
 taacaatcat actaaatata ttttgaagta caaagtttga catgctctaa agtgacaacc 240
 caaatgtgtc ttacaaaaca cgttcctaac aaggatgtgt ttactactacc aatgcagaaa 300
 c 301

<210> 247

<211> 301

<212> DNA

<213> Homo sapien

<400> 247

aggtcctttg gcagggctca tggatcagag ctcaaactgg agggaaaggc atttcgggta 60
 gcctaagagg gcgactggcg gcagcacaac caaggaaggc aagggtgttt cccccacgt 120
 gtgtcctgtg ttcaggtgcy acacacaatc ctcatgggaa caggatcacc catgcgctgc 180
 ccttgatgat caagggtggg gcttaagtgg attaagggag gcaagttctg gggtccttgc 240
 cttttcaaac catgaagtca ggctctgtat ccttcctttt cctaactgat attctaacta 300
 a 301

<210> 248
 <211> 301
 <212> DNA
 <213> Homo sapien

<400> 248
 aggtccttgg agatgccatt tcagccgaag gactcttctw ttcggaagta caccctcact 60
 attaggaaga ttcttagggg taatttttct gaggaaggag aactagccaa cttaagaatt 120
 acaggaagaa agtggtttgg aagacagcca aagaaataaa agcagattaa attgtatcag 180
 gtacattcca gcctgttggc aactccataa aaacatttca gattttaatc ccgaatttag 240
 ctaatgagac tggatttttg ttttttatgt tgtgtgtcgc agagctaaaa actcagttcc 300
 c 301

<210> 249
 <211> 301
 <212> DNA
 <213> Homo sapien

<400> 249
 gtccagagga agcacctggg gctgaactag gcttgccctg ctgtgaactt gcacttggag 60
 ccctgacgct gctgttctcc ccgaaaaacc cgaccgacct ccgcgatctc cgccccgcc 120
 ccagggagac acagcagtga ctacagagctg gtcgcacact gtgcctccct cctcaccgcc 180
 catcgtaatg aattattttg aaaattaatt ccaccatcct ttcagattct ggatggaaag 240
 actgaatctt tgactcagaa ttgtttgctg aaaagaatga rgtgactttc ttagtcattt 300
 a 301

<210> 250
 <211> 301
 <212> DNA
 <213> Homo sapien

<400> 250
 ggtctgtgac aaggacttgc aggctgtggg aggcaagtga cccttaacac tacacttctc 60
 ctatcttcta ttggcttgat aaacataatt atttctaaca ctacgttatt tccagttgcc 120
 cataagcaca tcagtacttt tctctggctg gaatagtaaa cttaaagtatg gtacatctac 180
 ctaaaagact actatgtgga ataatacata ctaatgaagt attacatgat ttaaagacta 240
 caataaaacc aaacatgctt ataacattaa gaaaaacaat aaagatacat gattgaaacc 300
 a 301

<210> 251
 <211> 301
 <212> DNA
 <213> Homo sapien

<400> 251
 gccgaggtcc tacatttggc ccagtttccc cctgcacccct ctccagggcc cctgcctcat 60
 agacaacctc atagagcata ggagaactgg ttgccctggg ggcaggggga ctgtctggat 120
 ggcaggggtc ctcaaaaatg ccactgtcac tgccaggaaa tgcttctgag cagtacacct 180
 cattgggatac aatgaaaagc ttcaagaaat cttcaggctc actctcttga aggcccgga 240
 cctctggagg ggggcagtgg aatcccagct ccaggacgga tcctgtcgaa aagatatcct 300
 c 301

<210> 252
 <211> 301

<212> DNA

<213> Homo sapien

<400> 252

```
gcaaccaatc actctgtttc acgtgacttt tatcaccata caatttggtg catttcctca      60
ttttctacat tgtagaatca agagtgtaaa taaatgtata tcgatgtctt caagaatata      120
tcatttccttt ttcactagga acccattcaa aatataagtc aagaatctta atatcaacaa      180
atatatcaag caaactggaa ggcagaataa ctaccataat ttagtataag tacccaaagt      240
tttataaatc aaaagcccta atgataacca tttttagaat tcaatcatca ctgtagaatc      300
a                                                                                   301
```

<210> 253

<211> 301

<212> DNA

<213> Homo sapien

<400> 253

```
ttccctaaga agatgttatt ttgttggtt ttgttcccccc tccatctcga ttctcgtacc      60
caactaaaaa aaaaaaataa agaaaaaatg tgctgcgttc tgaaaaataa ctcccttagct      120
tggctcgtatt gttttcagac cttaaaatat aaacttggtt cacaagcttt aatccatgtg      180
gatttttttt cttagagaac cacaaaacat aaaaggagca agtcggactg aatacctgtt      240
tccatagtgc ccacagggta ttcctcacat tttctccata ggaaaatgct ttttcccaag      300
g                                                                                   301
```

<210> 254

<211> 301

<212> DNA

<213> Homo sapien

<400> 254

```
cgctgcgcct ttcccttggg ggagggggcaa ggccagaggg ggtccaagtg cagcacgagg      60
aacttgacca attcccttga agcgggtggg ttaaaccctg taaatgggaa caaaatcccc      120
ccaaatctct tcattctacc ctggtggact cctgactgta gaattttttg gttgaaacaa      180
gaaaaaaata aagctttgga cttttcaagg ttgcttaaca ggtactgaaa gactggcctc      240
acttaaactg agccaggaaa agctgcagat ttattaatgg gtgtgttagt gtgcagtgcc      300
t                                                                                   301
```

<210> 255

<211> 302

<212> DNA

<213> Homo sapien

<400> 255

```
agcttttttt tttttttttt tttttttttt ttcattaaaa aatagtgtct tttattataa      60
attactgaaa tgtttctttt ctgaatataa atataaatat gtgcaaagtt tgacttggat      120
tgggattttg ttgagttctt caagcatctc ctaataccct caagggcctg agtagggggg      180
aggaaaaagg actggaggtg gaatctttat aaaaaacaag agtgattgag gcagattgta      240
aacattatta aaaaacaaga acaaaacaaa aaatatagaga aaaaaaccac cccaacacac      300
aa                                                                                   302
```

<210> 256

<211> 301

<212> DNA

<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(301)
<223> n = A,T,C or G

<400> 256
gttccagaaa acattgaagg tggcttccca aagtctaact agggatacc cctctagcct 60
aggaccctcc tccccacacc tcaatccacc aaaccatcca taatgcaccc agataggccc 120
acccccaaaa gcctggacac cttgagcaca cagttatgac caggacagac tcctctctat 180
aggcaaata gctgctggcaa actggcatta cctggtttgt ggggatgggg gggcaagtgt 240
gtggcctctc ggcttggtta gcaagaacat tcagggtagg cctaagttan tcgtgttagt 300
t 301

<210> 257
<211> 301
<212> DNA
<213> Homo sapien

<400> 257
gttgtggagg aactctggct tgctcattaa gtcctactga ttttcactat cccctgaatt 60
tccccactta tttttgtctt tcaactatcg aggccttaga agaggtctac ctgcctccag 120
tcttacctag tccagtctac cccctggagt tagaatggcc atcctgaagt gaaaagtaat 180
gtcacattac tcccttcagt gatttcttgt agaagtgcc atccctgaat gccaccaaga 240
tcttaatctt cacatcttta atcttatctc tttgactcct ctttacaccg gagaaggctc 300
c 301

<210> 258
<211> 301
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(301)
<223> n = A,T,C or G

<400> 258
cagcagtagt agatgccgta tgccagcacg cccagcactc ccaggatcag caccagcacc 60
agggggccag ccaccaggcg cagaagcaag ataaacagta ggctcaagac cagagccacc 120
cccagggcaa caagaatcca ataccaggac tgggcaaaat cttcaaagat cttaacactg 180
atgtctcggg cattgaggct gtcaataana cgctgatccc ctgctgtatg gtgggtgcat 240
tggtgatccc tgggagcgcc ggtggagtaa cgttgggtcca tggaaagcag cgcccacaac 300
t 301

<210> 259
<211> 301
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(301)
<223> n = A,T,C or G

<400> 259

```

tcatatatgc aaacaaatgc agactangcc tcaggcagag actaaaggac atctcttggg      60
gtgtcctgaa gtgatttgga cccctgaggg cagacaccta agtaggaatc ccagtgggaa      120
gcaaagccat aaggaagccc aggattcctt gtgatcagga agtggggccag gaaggctctgt      180
tccagctcac atctcatctg catgcagcac ggaccggatg cgcccaactgg gtcttggctt      240
ccctcccatc ttctcaagca gtgtccttgt tgagccattt gcatecttgg ctccagggtg      300
c                                                                           301

```

<210> 260

<211> 301

<212> DNA

<213> Homo sapien

<400> 260

```

ttttttttct ccctaaggaa aaagaaggaa caagtctcat aaaaccaaat aagcaatggt      60
aagggtgtctt aacttgaaaa agattaggag tctctgggtt acaagttata attgaatgaa      120
agaactgtaa cagccacagt tggccatttc atgccaatgg cagcaaacia caggattaac      180
tagggcaaaa taaataagtg tgtggaagcc ctgataagtg cttaataaac agactgattc      240
actgagacat cagtacctgc ccgggcggcc gctcgagccg aattctgcag atatccatca      300
c                                                                           301

```

<210> 261

<211> 301

<212> DNA

<213> Homo sapien

<400> 261

```

aaatattcga gcaaatcctg taactaatgt gtctccataa aaggctttga actcagtga      60
tctgtctcca tccacgattc tagcaatgac ctctcggaca tcaaagctcc tcttaagggt      120
agcaccaact attccataca attcatcagc aggaaataaa ggctcttcag aagggttcaat      180
ggtgacatcc aattttcttct gataatctag attcctcaca accttcctag ttaagtgaag      240
ggcatgatga tcatccaaag ccagtggtc acttactcca gactttctgc aatgaagatc      300
a                                                                           301

```

<210> 262

<211> 301

<212> DNA

<213> Homo sapien

<400> 262

```

gaggagagcc tggtacagca tttgtaagca cagaatactc caggagtatt tgtaattgtc      60
tgtgagcttc ttgccgcaag tctctcagaa atttaaaaag atgcaaatcc ctgagtcacc      120
cctagacttc ctaaaccaga tcctctgggg ctggaacctg gcaactctgca tttgtaatga      180
gggctttctg gtgcacacct aattttgtgc atctttgccc taaatcctgg attagtgcc      240
catcattacc cccacattat aatgggatag attcagagca gatactctcc agcaaagaat      300
c                                                                           301

```

<210> 263

<211> 301

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(301)

<223> n = A,T,C or G

<400> 263

| | | | | | | |
|------------|------------|------------|-------------|------------|------------|-----|
| tttagcttgt | ggtaaatgac | tcacaaaact | gatttttaaaa | tcaagttaat | gtgaattttg | 60 |
| aaaattacta | cttaatccta | attcacaata | acaatggcat | taaggtttga | cttgagttgg | 120 |
| ttcttagtat | tatttatggg | aaataggctc | ttaccacttg | caaataactg | gccacatcat | 180 |
| taatgactga | cttcccagta | aggctctcta | aggggtaagt | angaggatcc | acaggatttg | 240 |
| agatgctaag | gccccagaga | tcgtttgatc | caaccctctt | attttcagag | gggaaaatgg | 300 |
| g | | | | | | 301 |

<210> 264

<211> 301

<212> DNA

<213> Homo sapien

<400> 264

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| aaagacgtta | aaccactcta | ctaccacttg | tggaactctc | aaagggtaaa | tgacaaascc | 60 |
| aatgaatgac | tctaaaaaca | atatttacat | ttaatggttt | gtagacaata | aaaaaacaag | 120 |
| gtggatagat | ctagaattgt | aacattttta | gaaaaccata | scatttgaca | gatgagaaag | 180 |
| ctcaattata | gatgcaaagt | tataactaaa | ctactatagt | agtaaagaaa | tacatttcac | 240 |
| acccttcata | taaattcact | atcttggtt | gaggcactcc | ataaaatgta | tcacgtgcat | 300 |
| a | | | | | | 301 |

<210> 265

<211> 301

<212> DNA

<213> Homo sapien

<400> 265

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| tgcccaagtt | atgtgtaagt | gtatccgcac | ccagaggtaa | aactacactg | tcattcttgt | 60 |
| cttcttgtga | cgcagtat | cttctctggg | gagaagccgg | gaagtcttct | cctggctcta | 120 |
| catattcttg | gaagtctcta | atcaactttt | gttccatttg | tttcatttct | tcaggaggga | 180 |
| ttttcagttt | gtcaacatgt | tctctaacaa | cacttgccca | tttctgtaaa | gaatccaaag | 240 |
| cagtccaagg | ctttgacatg | tcaacaacca | gcataactag | agtatccttc | agagatacgg | 300 |
| c | | | | | | 301 |

<210> 266

<211> 301

<212> DNA

<213> Homo sapien

<400> 266

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| taccgtctgc | ccttctctcc | atccaggcca | tctgccaatc | tacatgggtc | ctcctattcg | 60 |
| acaccagatc | actctttcct | ctaccacacag | gcttgctatg | agcaagagac | acaacctcct | 120 |
| ctcttctgtg | ttccagcttc | ttttctgtt | cttcccaccc | cttaagttct | attcctgggg | 180 |
| atagagacac | caatacccat | aacctctctc | ctaagcctcc | ttataacca | gggtgcacag | 240 |
| cacagactcc | tgacaactgg | taaggccaat | gaactgggag | ctcacagctg | gctgtgcctg | 300 |
| a | | | | | | 301 |

<210> 267

<211> 301

<212> DNA

<213> Homo sapien

<400> 267

| | | | | | | |
|------------|------------|------------|------------|------------|------------|----|
| aaagagcaca | ggccagctca | gcctgccctg | gccatctaga | ctcagcctgg | ctccatgggg | 60 |
|------------|------------|------------|------------|------------|------------|----|

```

gtttctcagtg ctgagtcctat ccaggaaaag ctcacctaga ccttctgagg ctgaatcttc      120
atcctcacag gcagcttctg agagcctgat attcctagcc ttgatggctt ggagtaaagc      180
ctcattctga ttctctcctt tcttttcttt caagttggct ttctcacat ccctctgttc      240
aattcgcttc agcttgctg ctttagccct catttccaga agcttcttct ctttggcatc      300
t                                                                                   301

```

```

<210> 268
<211> 301
<212> DNA
<213> Homo sapien

```

```

<400> 268
aatgtctcac tcaactactt cccagcctac cgtggcctaa ttctgggagt tttcttctta      60
gatcttggga gagctgggtt ttctaaggag aaggaggaag gacagatgta actttggatc      120
tcgaagagga agtctaattg aagtaattag tcaacgggtc ttgtttagac tcttgggaata      180
tgctgggtgg ctcagtgagc ctttttgag aaagcaagta ttattcttaa ggagtaacca      240
cttcccattg ttctactttt taccatcatc aattgtatat tatgtattct ttggagaact      300
a                                                                                   301

```

```

<210> 269
<211> 301
<212> DNA
<213> Homo sapien

```

```

<400> 269
taacaatata cactagctat ctttttaact gtccatcatt agcaccaatg aagattcaat      60
aaaattacct ttattcacac atctcaaac aattctgcaa attcttagtg aagtttaact      120
atagtcacag accttaaata ttacatttgt ttctatgtc tactgaaaat aagttcacta      180
cttttctgga tattctttac aaaatcttat taaaattcct ggtattatca ccccaatta      240
tacagtagca caaccacctt atgtagtttt tacatgatag ctctgtagaa gtttcacatc      300
t                                                                                   301

```

```

<210> 270
<211> 301
<212> DNA
<213> Homo sapien

```

```

<400> 270
cattgaagag cttttgcgaa acatcagaac acaagtgcct ataaaattaa ttaagcctta      60
cacaagaata catattcctt ttatttctaa ggagttaaac atagatgtag ctgatgtgga      120
gagcttgctg gtgcagtgca tattggataa cactattcat ggccgaattg atcaagtcaa      180
ccaactcctt gaactggatc atcagaagaa ggtggtgca cgatatactg cactagataa      240
tggaccaacc aactaaattc tctcaccagg ctgtatcagt aaactggcct aacagaaaac      300
a                                                                                   301

```

```

<210> 271
<211> 301
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1) ... (301)
<223> n = A,T,C or G

```


<400> 271

| | |
|--|-----|
| aaaagggttct cataagatta acaattttaa taaatatttg atagaacatt ctttctcatt | 60 |
| tttatagctc atcttttagg ttgatattca gttcatgctt cccttgctgt tcttgatcca | 120 |
| gaattgcaat cacttcatca gcctgtattc gctccaattc tctataaagt ggggtccaagg | 180 |
| tgaaccacag agccacagca cacctctttc ccttggtgac tgccttcacc ccatganggt | 240 |
| tctctctcc agatganaac tgatcatgcg cccacatttt gggttttata gaagcagtca | 300 |
| c | 301 |

<210> 272

<211> 301

<212> DNA

<213> Homo sapien

<400> 272

| | |
|--|-----|
| taaattgcta agccacagat aacaccaatc aaatggaaca aatcaactgtc ttcaaatgtc | 60 |
| ttatcagaaa accaaatgag cctggaatct tcataatacc taaacatgcc gtatttagga | 120 |
| tccaataatt cctcatgat gagcaagaaa aattctttgc gcacctctcc tgcattccaca | 180 |
| gcattctctc caacaaatat aaccttgagt ggcttcttgc aatctatgtt ctttgttttc | 240 |
| ctaaggactt ccattgcac tcctacaata ttttctctac gcaccactag aattaagcag | 300 |
| g | 301 |

<210> 273

<211> 301

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(301)

<223> n = A,T,C or G

<400> 273

| | |
|---|-----|
| acatgtgtgt atgtgtatct ttgggaaan aanaagacat cttgtttayt atttttttgg | 60 |
| agagangctg ggacatggat aatcacwtaa ttgctayta tyactttaat ctgactygaa | 120 |
| gaaccgtcta aaaataaaat ttaccatgtc dtatattcct tatagtatgc ttatttcacc | 180 |
| ttyttctgt ccagagagag tatcagtgac ananatttma ggggtgaamac atgmattggt | 240 |
| gggacttnty ttacngagm accctgcccg sgcgcctcg makcngantt ccgcsananc | 300 |
| t | 301 |

<210> 274

<211> 301

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(301)

<223> n = A,T,C or G

<400> 274

| | |
|--|-----|
| cttatatact ctttctcaga ggcaaaagag gagatgggta atgtagacaa ttctttgagg | 60 |
| aacagtaaat gattattaga gagaangaat ggaccaagga gacagaaatt aacttgtaaa | 120 |
| tgattctctt tggaatctga atgagatcaa gaggccagct ttagcttggt gaaaagtcca | 180 |
| tctaggtatg gttgcattct cgtcttcttt tctgcagtag ataatgaggt aaccgaaggc | 240 |
| aattgtgctt cttttgataa gaagctttct tggatcatatc aggaaattcc aganaaagtc | 300 |

c

301

<210> 275
<211> 301
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(301)
<223> n = A,T,C or G

<400> 275

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| tcggtgtcag | cagcacgtgg | cattgaacat | tgcaatgtgg | agcccaaacc | acagaaaatg | 60 |
| gggtgaaatt | ggccaacttt | ctattaactt | atgttggcaa | ttttgccacc | aacagtaagc | 120 |
| tggcccttct | aataaaagaa | aattgaaagg | tttctcacta | aacggaatta | agtagtggag | 180 |
| tcaagagact | cccaggcctc | agcgtacctg | cccgggcggc | cgctcgaagc | cgaattctgc | 240 |
| agatatccat | cacactggcg | gncgctcgan | catgcatcta | gaaggnccaa | ttcgccctat | 300 |
| a | | | | | | 301 |

<210> 276
<211> 301
<212> DNA
<213> Homo sapien

<400> 276

| | | | | | | |
|-------------|------------|------------|-------------|------------|------------|-----|
| tgtacacata | ctcaataaat | aaatgactgc | attgtgggtat | tattactata | ctgattatat | 60 |
| ttatcatgtg | acttctaatt | agaaaatgta | tccaaaagca | aaacagcaga | tatacaaaat | 120 |
| taaagagaca | gaagatagac | attaacagat | aaggcaactt | atacattgag | aatccaaatc | 180 |
| caatacatctt | aaacatttgg | gaaatgaggg | ggacaaatgg | aagccagatc | aaatttgtgt | 240 |
| aaaactattc | agtatgtttc | ccttgcttca | tgtctgagaa | ggctctcctt | caatggggat | 300 |
| g | | | | | | 301 |

<210> 277
<211> 301
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(301)
<223> n = A,T,C or G

<400> 277

| | | | | | | |
|------------|------------|------------|------------|-------------|------------|-----|
| tttggtgatg | tcagtatctt | attacttgcg | ttatgagtgc | tcacctggga | aattctaaag | 60 |
| atacagagga | cttggaggaa | gcagagcaac | tgaatttaat | ttaaaagaag | gaaaacattg | 120 |
| gaatcatggc | actcctgata | ctttcccaaa | tcaacactct | caatgccccca | ccctcgtcct | 180 |
| caccatagtg | gggagactaa | agtggccacg | gatttgcctt | angtgtgcag | tgcgttctga | 240 |
| gttcnctgtc | gattacatct | gaccagtctc | ctttttccga | agtcctntccg | ttcaatcttg | 300 |
| c | | | | | | 301 |

<210> 278
<211> 301
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (301)
<223> n = A,T,C or G

<400> 278
taccactaca ctccagcctg ggcaacagag caagacctgt ctcaaagcat aaaatggaat 60
aacatatcaa atgaaacagg gaaaatgaag ctgacaattt atggaagcca gggcttgta 120
cagtctctac tggtattatg cattacctgg gaatttatat aagcccttaa taataatgcc 180
aatgaacatc tcatgtgtgc tcacaatgtt ctggcactat tataagtgtc tcacagggtt 240
tatgtgttct tcgtaacttt atggantagg tactcggccg cgaacacgct aagccgaatt 300
c 301

<210> 279
<211> 301
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (301)
<223> n = A,T,C or G

<400> 279
aaagcaggaa tgacaaagct tgcttttctg gtatgttcta ggtgtattgt gacttttact 60
gttatattaa ttgccaatat aagtaaataat agattatata tgtatagtgt ttcacaaagc 120
ttagaccttt accttccagc caccacacag tgcttgatat ttcagagtca gtcattgggt 180
atacatgtgt agttccaaag cacataagct agaanaanaa atatttctag ggagcactac 240
catctgtttt cacatgaaat gccacacaca tagaactcca acatcaattt cattgcacag 300
a 301

<210> 280
<211> 301
<212> DNA
<213> Homo sapien

<400> 280
ggtactggag ttttctccc ctgtgaaaac gtaactactg ttgggagtga attgaggatg 60
tagaaagggt gtggaaccaa attgtggta atggaatatg gagaatatgg ttctcactct 120
tgagaaaaaa acctaaagatt agcccaggta gttgcctgta acttcagttt ttctgcctgg 180
gtttgatata gtttaggggt ggggttagat taagatctaa attacatcag gacaaagaga 240
cagactatta actccacagt taattaagga ggtatgttcc atgtttattt gttaaagcag 300
t 301

<210> 281
<211> 301
<212> DNA
<213> Homo sapien

<400> 281
aggtacaaga aggggaatgg gaaagagctg ctgctgtggc attgttcaac ttggatatcc 60
gccgagcaat ccaaatcctg aatgaagggg catcttctga aaaaggagat ctgaatctca 120
atgtggtagc aatggcttta tcgggttata cggatgagaa gaactccctt tggagagaaa 180
tgtgtagcac actgcgatta cagctaaata acccgatttt gtgtgtcatg tttgcatttc 240

tgacaagtga aacaggatct tacgatggag ttttgtatga aaacaaagtt gcagtacctc 300
g 301

<210> 282

<211> 301

<212> DNA

<213> Homo sapien

<400> 282

caggtactac agaattaaaa tactgacaag caagtagttt cttggcgtgc acgaattgca 60
tccagaacct aaaaattaag aaattcaaaa agacattttg tgggcacctg ctagcacaga 120
agcgacagaag caaagccag gcagaacct gctaacctta cagctcagcc tgcacagaag 180
cgcagaagca aagccaggc agaacctgc taaccttaca gctcagcctg cacagaagcg 240
cagaagcaaa gccaggcag aacatgctaa ccttacagct cagcctgcac agaagcacag 300
a 301

<210> 283

<211> 301

<212> DNA

<213> Homo sapien

<400> 283

atctgtatac ggcagacaaa ctttatarag tgtagagagg tgagcgaaag gatgcaaaag 60
cactttgagg gctttataat aatatgctgc ttgaaaaaaa aaatgtgtag ttgatactca 120
gtgcatctcc agacatagta aggggttgc ctgaccaatc aggtgatcat tttttctatc 180
acttcccagg ttttatgcaa aaattttgtt aaattctata atgggtgatat gcatctttta 240
ggaaacatat acatttttaa aaatctattt tatgtaagaa ctgacagacg aatttgcttt 300
g 301

<210> 284

<211> 301

<212> DNA

<213> Homo sapien

<400> 284

caggtacaaa acgctattaa gtggcttaga atttgaacat ttgtggtctt tatttacttt 60
gcttcgtgtg tgggcaaagc aacatcttcc cttaaataat attaccaaga aaagcaagaa 120
gcagattagg tttttgacaa acaaacagg ccaaaagggg gctgacctgg agcagagcat 180
ggtgagaggc aaggcatgag agggcaagtt tgttgtggac agatctgtgc ctactttatt 240
actggagtaa aagaaaacaa agttcattga tgtcgaagga tatatacagt gttagaaatt 300
a 301

<210> 285

<211> 301

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(301)

<223> n = A,T,C or G

<400> 285

acatcaccat gatcggtacc cccacccatt atacgttgta tgtttacata aatactcttc 60
aatgatcatt agtgttttta aaaaaaact gaaaactcct tctgcatccc aatctctaac 120

caggaaagca aatgctatTT acagacCTgc aagccCTccc tcaaacnaaa ctatTTctgg 180
attaaatag tctgacttct tttgaggTca cactgactagg caaatgctat ttacgatctg 240
caaaagctgt ttgaagagtc aaagccccca tgtgaacacg atttctggac cctgtaacag 300
t 301

<210> 286

<211> 301

<212> DNA

<213> Homo sapien

<400> 286

taccactgca ttccagcctg ggtgacagag tgagactccg tctccaaaaa aaactttgct 60
tgtatattat ttttgcctta cagtggatca ttctagtagg aaaggacagt aagatttttt 120
atcaaaatgt gtcatgccag taagagatgt tatattcttt tctcatttct tccccacca 180
aaaataagct accatatagc ttataagtct caaatttttg ccttttacta aaatgtgatt 240
gtttctgttc attgtgtatg cttcatcacc tatattaggc aaattccatt ttttccttg 300
t 301

<210> 287

<211> 301

<212> DNA

<213> Homo sapien

<400> 287

tacagatctg ggaactaaat attaaaaatg agtgtggctg gatatatgga gaatgttggg 60
cccagaagga acgtagagat cagatattac aacagctttg ttttgagggt tagaaatatg 120
aaatgatttg gttatgaacg cacagttagg gcagcagggc cagaatcctg accctctgcc 180
ccgtgggttat ctccctccca gcttggctgc ctcatgttat cacagtatc cattttgttt 240
gttgcagtgc ttgtgaagcc atcaagattt tctcgtctgt tttcctctca ttggtaatgc 300
t 301

<210> 288

<211> 301

<212> DNA

<213> Homo sapien

<400> 288

gtacacctaa ctgcaaggac agctgaggaa tgtaatgggc agccgctttt aaagaagtag 60
agtcaatagg aagacaaatt ccagttccag ctcatgtctg gtatctgcaa agctgcaaaa 120
gatcttttaa gacaatttca agagaatatt tccttaaagt tggcaatttg gagatcatac 180
aaaagcatct gcttttgtga tttaatttag ctcatctggc cactggaaga atccaaacag 240
tctgccttaa ttttggatga atgcatgatg gaaattcaat aatttagaaa gttaaaaaaa 300
a 301

<210> 289

<211> 301

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (301)

<223> n = A,T,C or G

<400> 289

ggtagactgt ttccatgtta tgtttctaca cattgctacc tcagtgtcc tggaaactta 60
gcttttgatg tctccaagta gtccaccttc atttaactct ttgaaactgt atcatctttg 120
ccaagtaaga gtggtggcct atttcagctg ctttgacaaa atgactggct cctgacttaa 180
cgttctataa atgaatgtgc tgaagcaaag tgcccatggt ggcggcgaan aagagaaaga 240
tgtgttttgt tttggactct ctgtgggtccc ttccaatgct gtgggtttcc aaccagnnga 300
a 301

<210> 290

<211> 301

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(301)

<223> n = A,T,C or G

<400> 290

acactgagct cttcttgata aatatacaga atgcttggca tatacaagat tctatactac 60
tgactgatct gttcatttct ctcacagctc ttaccccaa aagcttttcc accctaagtg 120
ttctgacctc cttttctaata cacagtaggg atagaggcag anccacctac aatgaacatg 180
gagttctatc aagaggcaga aacagcacag aatcccagtt ttaccattcg ctacagtgct 240
tgcttgaac aaaaacattt ctccatgtct cattttcttc atgcctcaag taacagtgag 300
a 301

<210> 291

<211> 301

<212> DNA

<213> Homo sapien

<400> 291

caggtacca tttcttctat cctagaaaca tttcatttta tgttgttgaa acataacaac 60
tatatcagct agattttttt tctatgcttt acctgctatg gaaaatttga cacattctgc 120
tttactcttt tgtttatagg tgaatcacia aatgtatttt tatgtattct gtatgtcaat 180
agccatggct gtttacttca ttttaatttat ttagcataaa gacattatga aaaggcctaa 240
acatgagctt cacttcccca ctaactaatt agcatctggt atttcttaac cgtaatgcct 300
a 301

<210> 292

<211> 301

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(301)

<223> n = A,T,C or G

<400> 292

accttttagt agtaatgtct aataataaat aagaaatcaa ttttataagg tccatatagc 60
tgtattaaat aatttttaag tttaaaagat aaaataccat catttttaaat gttggtattc 120
aaaaccaaag natataaccg aaaggaaaaa cagatgagac ataaaatgat ttgcnagatg 180
ggaaatatag tasttyatga atgttnatta aattccagtt ataatatagg ctacacactc 240
tcactacaca cacagacccc acagtcctat atgccacaaa cacattttcca taacttgaaa 300
a 301

<210> 293
<211> 301
<212> DNA
<213> Homo sapien

<400> 293
ggtagcaagt gctggtagca gctgtgtacc tgttctcact gaaaagtctg gctaagtctc 60
ttgtgtagtc acttctgatt ctgacaatca atcaatcaat ggcctagagc actgactgtt 120
aacacaaacg tcactagcaa agtagcaaca gctttaagtc taaatacaaa gctgttctgt 180
gtgagaattt tttaaaaggc tacttgtata ataacccttg tcatttttaa tgtacctcgg 240
ccgcgaccac gctaagccga attctgcaga tatccatcac actggcggcc gctcgagcat 300
g 301

<210> 294
<211> 301
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(301)
<223> n = A,T,C or G

<400> 294
tgacccataa caatatacac tagctatctt ttttaactgtc catcattagc accaatgaag 60
attcaataaa attaccttta ttcacacatc tcaaaacaat tctgcaaatt cttagtgaag 120
tttaactata gtcacaganc ttaaattatc acattgtttt ctatgtctac tgaaaataag 180
ttcactactt ttctgggata ttctttacaa aatcttatta aaattcctgg tattatcacc 240
cccaattata cagtagcaca accaccttat gtagttttta catgatagct ctgtagaggt 300
t 301

<210> 295
<211> 305
<212> DNA
<213> Homo sapien

<400> 295
gtactctttc tctccctcc tctgaattta attctttcaa cttgcaattt gcaaggatta 60
cacatttcac tgtgatgtat attgtgttgc aaaaaaaaaa gtgtctttgt ttaaaattac 120
ttggtttgtg aatccatctt gctttttccc cattggaact agtcattaac ccattctctga 180
actggtagaa aaacrtctga agagctagtc tatcagcatc tgacaggtga attggatggt 240
tctcagaacc atttcaccca gacagcctgt ttctatcctg ttttaataaat tagtttgggt 300
tctct 305

<210> 296
<211> 301
<212> DNA
<213> Homo sapien

<400> 296
aggtagtatg ggaagctgct aaaataatat ttgatagtaa aagtagttaa tgtgctatct 60
cacctagtag taaactaaaa ataaactgaa actttatgga atctgaagtt attttccttg 120
attaaataga attaataaac caatatgagg aaacatgaaa ccatgcaatc tactatcaac 180
tttgaaaaag tgattgaacg aaccacttag ctttcagatg atgaacactg ataagtcatt 240

tgtcattact ataaatttta aaatctgtta ataagatggc ctatagggag gaaaaagggg 300
c 301

<210> 297

<211> 300

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(300)

<223> n = A,T,C or G

<400> 297

actgagtttt aactggacgc caagcaggca aggctggaag gttttgctct ctttgtgcta 60
aaggttttga aaaccttgaa ggagaatcat ttgacaaga agtacttaag agtctagaga 120
acaaagangt gaaccagctg aaagctctcg ggggaanctt acatgtgttg ttaggcctgt 180
tccatcattg ggagtgcact ggccatccct caaaatttgt ctgggctggc ctgagtggtc 240
accgcacctc ggccgcgacc acgctaagcc gaattctgca gatatccatc acactggcgg 300

<210> 298

<211> 301

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(301)

<223> n = A,T,C or G

<400> 298

tatggggttt gtcacccaaa agctgatgct gagaaaggcc tccctggggc ccctcccgcg 60
ggcatctgag agacctggtg ttccagtgtt tctggaaatg ggtcccagtg ccgccggctg 120
tgaagctctc agatcaatca cgggaagggc ctggcggtgg tggccacctg gaaccacctt 180
gtcctgtctg ttacatttc actaycaggt ttctctggg cattacnatt tgttccccta 240
caacagtgac ctgtgcattc tgctgtggcc tgctgtgtct gcagggtggc ctcagcgagg 300
t 301

<210> 299

<211> 301

<212> DNA

<213> Homo sapien

<400> 299

gttttgagac ggagtttcac tcttgttgcc cagactggac tgcaatggca ggggtctctgc 60
tcactgcacc ctctgcctcc caggttcgag caattctcct gcctcagcct cccaggtagc 120
tgggattgca ggctcacgcc accataccca gctaattttt ttgtattttt agtagagacg 180
gagtttcgcc atgttggtcca gctgggtctca aactcctgac ctcaagcgac ctgcctgcct 240
cggcctccca aagtgtctga attataggca tgagtcaaca cgcccagcct aaagatatatt 300
t 301

<210> 300

<211> 301

<212> DNA

<213> Homo sapien

<400> 300

attcagtttt atttgctgcc ccagtatctg taaccaggag tgccacaaaa tcttgccaga 60
tatgtccac acccactggg aaaggctccc acctggctac ttcctctatc agctgggtca 120
gctgcattcc acaaggttct cagcctaata agtttacta cctgccagtc tcaaaactta 180
gtaaagcaag accatgacat tccccacgg aatcagagt ttgccccacc gtcttggtac 240
tataaagcct gcctctaaca gtccttgctt cttcacacca atcccgagcg catcccccat 300
g 301

<210> 301

<211> 301

<212> DNA

<213> Homo sapien

<400> 301

ttaaattttt gagaggataa aaaggacaaa taatctagaa atgtgtcttc ttcagtctgc 60
agaggacccc aggtctccaa gcaaccacat ggtcaagggc atgaataatt aaaagtgggt 120
gggaactcac aaagaccctc agagctgaga caccacaaac agtgggagct cacaaagacc 180
ctcagagctg agacacccac aacagtggga gctcaciaag accctcagag ctgagacacc 240
cacaacagca cctcgttcag ctgccacatg tgtgaataag gatgcaatgt ccagaagtgt 300
t 301

<210> 302

<211> 301

<212> DNA

<213> Homo sapien

<400> 302

aggtacacat ttagcttggt gtaaataact caaaaactg attttaaaat caagttaatg 60
tgaattttga aaattactac ttaatcctaa ttcacaataa caatggcatt aaggtttgac 120
ttgagttggt tcttagtatt atttatggta aataggctct taccacttgc aaataactgg 180
ccacatcatt aatgactgac ttcccagtaa ggctctctaa ggggtaagta ggaggatcca 240
caggatttga gatgctaagg ccccagagat cgtttgatcc aacctcttta ttttcagagg 300
g 301

<210> 303

<211> 301

<212> DNA

<213> Homo sapien

<400> 303

aggtaccaac tgtggaaata ggtagaggat cattttttct tcccatatca actaagttgt 60
atattgtttt ttgacagttt aacacatctt cttctgtcag agattctttc acaatagcac 120
tggctaattg aactaccgct tgcattgtaa aaatgggtgt ttgtgaaatg atcataggcc 180
agtaacgggt atgtttttct aactgatctt ttgctcgttc caaagggacc tcaagacttc 240
catcgatttt atatctgggg tctagaaaag gagttaatct gttttccctc ataaattcac 300
c 301

<210> 304

<211> 301

<212> DNA

<213> Homo sapien

<400> 304

acatggatgt tattttgcag actgtcaacc tgaatttgta ttgcttgac attgcctaatt 60

```

tattagtttc agtttcagct taccactttt ttgtctgcaa catgcaraas agacagtgcc      120
cttttttagtg tatcatatca ggaatcatct cacattgggt ttgtgccatta ctggtgcagt      180
gacttttcagc cacttgggta aggtggagtt ggccatatgt ctccactgca aaattactga      240
ttttcctttt gtaattaata agtgtgtgtg tgaagattct ttgagatgag gtatatatct      300
c                                                                           301

```

<210> 305

<211> 301

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(301)

<223> n = A,T,C or G

<400> 305

```

gangtacagc gtggtcaagg taacaagaag aaaaaaatgt gagtggcatc ctgggatgag      60
cagggggaca gacctggaca gacacgttgt catttgctgc tgtgggtagg aaaatgggag      120
taaaggagga gaaacagata caaaatctcc aactcagtat taaggtattc tcatgcctag      180
aatattggta gaaacaagaa tacattcata tggcaaataa ctaaccatgg tggaacaaaa      240
ttctgggatt taagttggat accaangaaa ttgtattaaa agagctgttc atggaataag      300
a                                                                           301

```

<210> 306

<211> 8

<212> PRT

<213> Homo sapien

<400> 306

```

Val Leu Gly Trp Val Ala Glu Leu
1           5

```

<210> 307

<211> 637

<212> DNA

<213> Homo sapien

<400> 307

```

acaggggatg aagggaag gagaggatga ggaagcccc ctggggattt ggtttggtcc      60
ttgtgatcag gtggtctatg gggcttatcc ctacaaagaa gaatccagaa ataggggcac      120
attgaggaat gatacttgag cccaaagagc attcaatcat tgttttattt gccttmtttt      180
cacaccattg gtgagggagg gattaccacc ctggggttat gaagatggtt gaacacccca      240
cacatagcac cggagatatg agatcaacag tttcttagcc atagagattc acagcccaga      300
gcaggaggac gcttgcacac catgcaggat gacatggggg atgcgctcgg gattgggtgtg      360
aagaagcaag gactgttaga ggcaggcttt atagtaacaa gacggtgagg caaactctga      420
tttcctgagg ggaatgtcat ggtcttgctt tactaagttt tgagactggc aggtagttaa      480
actcattagg ctgagaacct tgtggaatgc acttgaccca sctgatagag gaagtagcca      540
ggtgggagcc tttcccagtg ggtgtgggac atatctggca agattttgtg gcactcctgg      600
ttacagatac tggggcagca aataaaaactg aatcttg                                     637

```

<210> 308

<211> 647

<212> DNA

<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(647)
<223> n = A,T,C or G

<400> 308

| | | | | | | |
|------------|------------|------------|-------------|------------|-------------|-----|
| acgattttca | ttatcatgta | aatcgggtca | ctcaaggggc | caaccacagc | tgggagccac | 60 |
| tgctcagggg | aaggttcata | tgggactttc | tactgcccac | ggttctatac | aggatataaa | 120 |
| ggngcctcac | agtatagatc | tggtagcaaa | gaagaagaaa | caaacactga | tctctttctg | 180 |
| ccacccctct | gaccctttgg | aactcctctg | accctttaga | acaagcctac | ctaataatctg | 240 |
| ctagagaaaa | gaccaacaac | ggcctcaaag | gatctcttac | catgaaggtc | tcagctaatt | 300 |
| cttggctaag | atgtgggttc | cacattaggt | tctgaatatg | gggggaagg | tcaatttgct | 360 |
| cattttgtgt | gtggataaag | tcaggatgcc | cagggggccag | agcagggggc | tgcttgcttt | 420 |
| gggaacaatg | gctgagcata | taaccatagg | ttatggggaa | caaaacaaca | tcaaagtcac | 480 |
| tgatcaatt | gccatgaaga | cttgagggac | ctgaatctac | cgattcatct | taaggcagca | 540 |
| ggaccagttt | gagtggcaac | aatgcagcag | cagaatcaat | ggaaacaaca | gaatgattgc | 600 |
| aatgtccttt | ttttctcct | gcttctgact | tgataaaaag | ggaccgt | | 647 |

<210> 309
<211> 460
<212> DNA
<213> Homo sapien

<400> 309

| | | | | | | |
|------------|------------|------------|-------------|------------|------------|-----|
| actttatagt | ttaggctgga | cattggaaaa | aaaaaaaaagc | cagaacaaca | tgtgatagat | 60 |
| aatatgattg | gctgcacact | tccagactga | tgaatgatga | acgtgatgga | ctattgtatg | 120 |
| gagcacatct | tcagcaagag | gggaaaatac | tcatcatttt | tggccagcag | ttgtttgatc | 180 |
| accaaacatc | atgccagaat | actcagcaaa | ccttcttagc | tcttgagaag | tcaaagtccg | 240 |
| ggggaattta | ttcctggcaa | ttttaattgg | actccttatg | tgagagcagc | ggctaccacg | 300 |
| ctgggggtgg | ggagcgaacc | cgtcactagt | ggacatgcag | tggcagagct | cctggtaacc | 360 |
| acctagagga | atacacaggc | acatgtgtga | tgccaagcgt | gacacctgta | gcactcaaat | 420 |
| ttgtcttggt | tttgtctttc | ggtgtgtaag | attcttaagt | | | 460 |

<210> 310
<211> 539
<212> DNA
<213> Homo sapien

<400> 310

| | | | | | | |
|------------|------------|------------|-------------|-------------|-------------|-----|
| acgggactta | tcaaataaag | ataggaaaag | aagaaaactc | aaatattata | ggcagaaatg | 60 |
| ctaaaggttt | taaaatatgt | caggattgga | agaaggcatg | gataaagaac | aaagttcagt | 120 |
| taggaaagag | aaacacagaa | ggaagagaca | caataaaagt | cattatgtat | tctgtgagaa | 180 |
| gtcagacagt | aagatttgtg | ggaaatgggt | tggtttgttg | tatggtatgt | atttttagcaa | 240 |
| taatctttat | ggcagagaaa | gctaaaatcc | tttagcttgc | gtgaatgatc | acttgctgaa | 300 |
| ttcctcaagg | taggcatgat | gaaggagggt | ttagaggaga | cacagacaca | atgaactgac | 360 |
| ctagatagaa | agccttagta | tactcagcta | ggaatagtga | ttctgagggc | acactgtgac | 420 |
| atgattatgt | cattacatgt | atggtagtga | tggggatgat | aggaagggaag | aacttatggc | 480 |
| atattttcac | ccccacaaaa | gtcagttaaa | tattggggaca | ctaaccatcc | aggtcaaga | 539 |

<210> 311
<211> 526
<212> DNA
<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(526)
 <223> n = A,T,C or G

<400> 311
 caaatttgag ccaatgacat agaattttac aaatcaagaa gcttattctg gggccatttc 60
 ttttgacgtt ttctctaaac tactaaagag gcattaatga tccataaatt atattatcta 120
 catttacagc atttaaaatg tggtcagcat gaaatattag ctacagggga agctaaataa 180
 attaaacatg gaataaagat ttgtccctta atataatcta caagaagact ttgatatttg 240
 tttttcacia gtgaagcatt cttataaagt gtcataacct ttttggggaa actatgggaa 300
 aaaatgggga aactctgaag gggttttaagt atcttacctg aagctacaga ctccataacc 360
 tctctttaca gggagctcct gcagccccta cagaaatgag tggctgagat tcttgattgc 420
 acagcaagag cttctcatct aaaccctttc cctttttagt atctgtgtat caagtataaa 480
 agttctataa actgtagtnt acttatttta atccccaaag cacagt 526

<210> 312
 <211> 500
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(500)
 <223> n = A,T,C or G

<400> 312
 cctctctctc cccaccccct gactctagag aactgggttt tctcccagta ctccagcaat 60
 tcattttctga aagcagttga gccactttat tccaaagtac actgcagatg ttcaaactct 120
 ccattttctct ttcccttcca cctgccagtt ttgctgactc tcaacttgct atgagtgtaa 180
 gcattaagga cattatgctt cttcgattct gaagacaggc cctgctcatg gatgactctg 240
 gcttcttagg aaaatatttt tcttccaaaa tcagtaggaa atctaaactt atcccctctt 300
 tgcagatgtc tagcagcttc agacatttgg ttaagaacct atgggaaaaa aaaaaatcct 360
 tgctaattgt gtttcttttg taaaccanga ttcttatttg nctggtatag aatatcagct 420
 ctgaacgtgt ggttaaagatt tttgtgttg aatataggag aaatcagttt gctgaaaagt 480
 tagtcttaat tatctattgg 500

<210> 313
 <211> 718
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(718)
 <223> n = A,T,C or G

<400> 313
 ggagatttgt gtggtttgca gccgaggag accaggaaga tctgcatggt gggaaggacc 60
 tgatgataca gaggtgagaa ataagaaagg ctgctgactt taccatctga ggccacacat 120
 ctgctgaaat ggagataatt aacatcacta gaaacagcaa gatgacaata taatgtctaa 180
 gtagtgacat gtttttgac atttccagcc cttttaaata tccacacaca caggaagcac 240
 aaaaggaaagc acagagatcc ctgggagaaa tgccggcccg ccattctggg tcatcgatga 300
 gcctcgccct gtgcctgntc ccgcttgta gggaaggaca ttagaaaatg aattgatgtg 360
 ttccttaaag gatggcagga aaacagatcc tgttgtggat atttatttga acgggattac 420

| | |
|---|-----|
| agatttgaaa tgaagtcaca aagtgagcat taccaatgag aggaaaacag acgagaaaat | 480 |
| cttgatgggt cacaagacat gcaacaaaca aaatggaata ctgtgatgac acgagcagcc | 540 |
| aactggggag gagataccac ggggcagagg tcaggattct ggccctgctg cctaactgtg | 600 |
| cgttatacca atcatttcta tttctaccct caaacaagct gtngaatatc tgacttacgg | 660 |
| ttcttntggc ccacattttc atnatccacc ccntcntttt aannttantic caaantgt | 718 |

<210> 314

<211> 358

<212> DNA

<213> Homo sapien

<400> 314

| | |
|---|-----|
| gtttattttac attacagaaa aaacatcaag acaatgtata ctattttcaaa tatatccata | 60 |
| cataatcaaa tatagctgta gtacatgttt tcattgggtg agattaccac aaatgcaagg | 120 |
| caacatgtgt agatctcttg tcttattctt ttgtctataa tactgtattg tgtagtccaa | 180 |
| gctctcggtg gtccagccac tgtgaaacat gctcccttta gattaacctc gtggacgctc | 240 |
| ttgttgattt gctgaactgt agtgccctgt attttgcttc tgtctgtgaa ttctgttgct | 300 |
| tctggggcat ttccttgta tgcagaggac caccacacag atgacagcaa tctgaatt | 358 |

<210> 315

<211> 341

<212> DNA

<213> Homo sapien

<400> 315

| | |
|--|-----|
| taccacctcc ccgctggcac tgatgagccg catcaccatg gtcaccagca ccatgaaggc | 60 |
| ataggtgatg atgaggacat ggaatgggcc cccaaggatg gtctgtccaa agaagcgagt | 120 |
| gacccccatt ctgaagatgt ctggaacctc taccagcagg atgatgatag ccccaatgac | 180 |
| agtcaccagc tccccgacca gccggatata gtccttaggg gtcattgtagg cttcctgaag | 240 |
| tagcttctgc tgtaagaggg tggtgtcccg ggggctcgtg cggttattgg tcttgggctt | 300 |
| gagggggcgg tagatgcagc acatggtgaa gcagatgatg t | 341 |

<210> 316

<211> 151

<212> DNA

<213> Homo sapien

<400> 316

| | |
|---|-----|
| agactgggca agactcttac gccccacact gcaatttggt cttgttgccg tatccattta | 60 |
| tgtgggcttt tctcgagttt ctgattataa acaccactgg agcgatgtgt tgactggact | 120 |
| cattcaggga gctctgggtg caatattagt t | 151 |

<210> 317

<211> 151

<212> DNA

<213> Homo sapien

<400> 317

| | |
|---|-----|
| agaactagtg gatcctaag aaataacctga aacatatatt ggcatttatc aatggctcaa | 60 |
| atcttcattt atctctggcc ttaacctgg ctcctgaggg tgcggccagc agatcccagg | 120 |
| ccagggtctt gttcttgcca cacctgcttg a | 151 |

<210> 318

<211> 151

<212> DNA

<213> Homo sapien

<400> 318

```
actggtggga ggcgctgttt agttggctgt ttccagaggg gtctttcgga gggacctcct    60
gctgcaggct ggagtgtctt tattcctggc gggagaccgc acattccact gctgaggctg    120
tgggggcggt ttatcaggca gtgataaaca t                                  151
```

<210> 319

<211> 151

<212> DNA

<213> Homo sapien

<400> 319

```
aactagtggg tccagagcta taggtacagt gtgatctcag ctttgcaaac acattttcta    60
catagatagt actaggtatt aatagatatg taaagaaaga aatcacacca ttaataatgg    120
taagattggg tttatgtgat tttagtgggt a                                  151
```

<210> 320

<211> 150

<212> DNA

<213> Homo sapien

<400> 320

```
aactagtggg tccactagtc cagtgtgggt gaattccatt gtgttggggg tctagatcgc    60
gagcggctgc cttttttttt tttttttttg ggggggaatt tttttttttt aatagttatt    120
gagtgttcta cagcttacag taaataccat                                  150
```

<210> 321

<211> 151

<212> DNA

<213> Homo sapien

<400> 321

```
agcaactttg tttttcatcc aggttatatt aggcttagga tttcctctca cactgcagtt    60
taggggtggc ttgtaaccag ctatggcata ggtgttaacc aaaggctgag taaacatggg    120
tgctctgag aaatcaaagt cttcatacac t                                  151
```

<210> 322

<211> 151

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (151)

<223> n = A,T,C or G

<400> 322

```
atccagcatc ttctcctgtt tcttgcttc cttttcttc ttcttasatt ctgcttgagg    60
tttgggcttg gtcagtttgc cacagggctt ggagatgggt acagtcttct ggcattcggc    120
attgtgcagg gctcgttca nacttccagt t                                  151
```

<210> 323

<211> 151

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(151)

<223> n = A,T,C or G

<400> 323

| | | |
|--|------------|-----|
| tgaggacttg tktttctttt ctttattttt aatcctctta ckttgtaa | atattgccta | 60 |
| nagactcant tactaccag tttgtggtt twtgggagaa atgtaactgg | acagttagct | 120 |
| gttcaatyaa aaagacactt ancccatgtg g | | 151 |

<210> 324

<211> 461

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(461)

<223> n = A,T,C or G

<400> 324

| | | |
|---|-------------|-----|
| acctgtgtgg aatttcagct ttctcatgc aaaaggattt tgtatccccg | gcctacttga | 60 |
| agaagtggtc agctaaagga atccagggtt ttggttggac tgttaatacc | tttgatgaaa | 120 |
| agagttacta cgaatcccat cttggttcca gctatatcac tgacagcatg | gtagaagact | 180 |
| gcgaacctca cttctagact ttacacggtg gacgaaacgg gtccagaaac | tgccaggggc | 240 |
| ctcatacagg gatatacaaaa taccctttgt gctacccagg ccctggggaa | tcagggtgact | 300 |
| cacacaaatg caatagtttg tcaactgcatt tttacctgaa ccaaagctaa | acccgggtgtt | 360 |
| gccaccatgc accatggcat gccagagttc aacactgttg ctcttgaaaa | ttgggtctga | 420 |
| aaaaacgcac aagagccct gccctgccct agctgangca c | | 461 |

<210> 325

<211> 400

<212> DNA

<213> Homo sapien

<400> 325

| | | |
|--|------------|-----|
| acactgtttc catgttatgt ttctacacat tgctacctca gtgctcctgg | aaacttagct | 60 |
| tttgatgtct ccaagtagtc caccttcatt taactctttg aaactgtatc | atctttgcca | 120 |
| agtaagagtg gtggcctatt tcagctgctt tgacaaaatg actggctcct | gacttaacgt | 180 |
| tctataaatg aatgtgctga agcaaatg ccattggtggc ggcaagaag | agaaagatgt | 240 |
| gttttgtttt ggactctctg tggcccttc caatgctgtg ggtttccaac | caggggaagg | 300 |
| gtcccttttg cattgccaag tgccataacc atgagcacta cgctaccatg | gttctgcctc | 360 |
| ctggccaagc aggctggtt gcaagaatga aatgaatgat | | 400 |

<210> 326

<211> 1215

<212> DNA

<213> Homo sapien

<400> 326

| | | |
|--|------------|-----|
| ggaggactgc agcccgact cgcagccctg gcaggcggca ctggtcatgg | aaaacgaatt | 60 |
| gttctgctcg ggcgtcctgg tgcatacgca gtgggtgctg tcagccgcac | actgtttcca | 120 |
| gaactcctac accatcgggc tgggcctgca cagtcttgag gccgaccaag | agccagggag | 180 |

```

ccagatggtg gaggccagcc tctccgtacg gcaccagag tacaacagac ccttgctcgc 240
taacgacctc atgctcatca agttggacga atccgtgtcc gagtctgaca ccatccggag 300
catcagcatt gcttcgcagt gccctaccgc ggggaactct tgccctggtt ctggctgggg 360
tctgctggcg aacggcagaa tgcctaccgt gctgcagtgc gtgaacgtgt cgggtggtgtc 420
tgaggagggtc tgcagtaagc tctatgacct gctgtaccac cccagcatgt tctgcgccgg 480
cggaggggcaa gaccagaagg actcctgcaa cggtgactct gggggggccc tgatctgcaa 540
cgggtacttg cagggccttg tgtctttcgg aaaagccccg tgtggccaag ttggcgtgcc 600
aggtgtctac accaacctct gcaaattcac tgagtggata gagaaaaccg tccaggccag 660
ttaactctgg ggactgggaa cccatgaaat tgacccccaa atacatcctg cggaaggaat 720
tcaggaaatc ctgttcccag cccctcctcc ctcaggccca ggagtccagg cccccagccc 780
ctcctccctc aaaccaaggg tacagatccc cagccctccc tccctcagac ccaggagtcc 840
agacccccca gccctcctc cctcagacct aggagtccag cccctcctcc ctcagaccca 900
ggagtccaga cccccagcc cctcctcctc cagaccagg ggtccaggcc cccaaccctc 960
cctccctcag actcagaggt ccaagcccc aaccctcct tccccagacc cagaggtcca 1020
ggtcccagcc cctcctcctc cagaccagc ggtccaatgc cacctagact ctcctgtac 1080
acagtgcccc cttgtggcac gttgaccaa ccttaccagt tggtttttca tttttgtcc 1140
ctttccccta gatccagaaa taaagtctaa gagaagcgca aaaaaaaaaa aaaaaaaaaa 1200
aaaaaaaaa aaaaaa 1215

```

<210> 327

<211> 220

<212> PRT

<213> Homo sapien

<400> 327

```

Glu Asp Cys Ser Pro His Ser Gln Pro Trp Gln Ala Ala Leu Val Met
1          5          10          15
Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val His Pro Gln Trp Val
20          25          30
Leu Ser Ala Ala His Cys Phe Gln Asn Ser Tyr Thr Ile Gly Leu Gly
35          40          45
Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Met Val Glu
50          55          60
Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu Leu Ala
65          70          75          80
Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu Ser Asp
85          90          95
Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala Gly Asn
100          105          110
Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly Arg Met Pro
115          120          125
Thr Val Leu Gln Cys Val Asn Val Ser Val Val Ser Glu Glu Val Cys
130          135          140
Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe Cys Ala Gly
145          150          155          160
Gly Gly Gln Asp Gln Lys Asp Ser Cys Asn Gly Asp Ser Gly Gly Pro
165          170          175
Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe Gly Lys Ala
180          185          190
Pro Cys Gly Gln Val Gly Val Pro Gly Val Tyr Thr Asn Leu Cys Lys
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Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Ala Ser
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<210> 328

<211> 234
 <212> DNA
 <213> Homo sapien

<400> 328
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 atccgcagtg ggtgctgtca gccacacact gtttccagaa ctctacacc atcgggctgg 180
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<210> 329
 <211> 77
 <212> PRT
 <213> Homo sapien

<400> 329
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 35 40 45
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 65 70 75

<210> 330
 <211> 70
 <212> DNA
 <213> Homo sapien

<400> 330
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 gctgcagcca 70

<210> 331
 <211> 22
 <212> PRT
 <213> Homo sapien

<400> 331
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 Val Ser Gly Ser Cys Ser
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<210> 332
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| gtacatcaac | tggttcagctt | cctgggaaaag | tagttgtggt | cacaggagct | aatacaggta | 180 |
| tcgggaagga | gacagccaaa | gagctggctc | agagaggagc | tcgagtatat | ttagcttgcc | 240 |
| gggatgtgga | aaagggggaa | ttggtggcca | aagagatcca | gaccacgaca | gggaaccagc | 300 |
| aggtgttgg | gcggaaaactg | gacctgtctg | atactaagtc | tattcgagct | tttgctaagg | 360 |
| gcttcttagc | tgaggaaaag | cacctccacg | ttttgatcaa | caatgcagga | gtgatgatgt | 420 |
| gtccgtactc | gaagacagca | gatggctttg | agatgcacat | aggagtcaac | cacttgggtc | 480 |
| acttccctct | aacctatctg | ctgctagaga | aactaaagga | atcagcccca | tcaaggatag | 540 |
| taaatgtgtc | ttccctcgca | catcacctgg | gaaggatcca | cttccataac | ctgcaggggc | 600 |
| agaaattcta | caatgcaggc | ctggcctact | gtcacagcaa | gctagccaac | atcctcttca | 660 |
| cccaggaact | ggcccggaga | ctaaaaggct | ctggcggttac | gacgtattct | gtacaccctg | 720 |
| gcacagtcca | atctgaactg | gttcggcact | catctttcat | gagatggatg | tggtggcttt | 780 |
| tctccttttt | catcaagact | cctcagcagg | gagcccagac | cagcctgcac | tgtgccttaa | 840 |
| cagaaggtct | tgagattcta | agtgggaatc | atttcagtga | ctgtcatgtg | gcatgggtct | 900 |
| ctgcccagc | tcgtaatgag | actatagcaa | ggcggctgtg | ggacgtcagt | tgtgacctgc | 960 |
| tgggctctcc | aatagactaa | caggcagtgc | cagttggacc | caagagaaga | ctgcagcaga | 1020 |
| ctacacagta | cttcttgtca | aaatgattct | ccttcaagg | tttcaaaacc | tttagacaa | 1080 |
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| cccaggcatg | gtggatcacc | ggaggtcagt | agttcaagac | cagcctggcc | aacatggtga | 1500 |
| aacccccact | ctactaaaaa | ttgtgtatat | ctttgtgtgt | cttctgtttt | atgtgtgcca | 1560 |
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| ccatccagtc | tttatgcaaa | tgaaatgctg | caaagggaag | cagattctgt | atatgttggt | 1680 |
| aactaccac | caagagcaca | tgggtagcag | ggaagaagta | aaaaaagaga | aggagaatac | 1740 |
| tgggaagataa | tgcacaaaat | gaagggacta | gttaaggatt | aactagccct | ttaaggatta | 1800 |
| actagttaag | gattaatagc | aaaagayatt | aaatatgcta | acatagctat | ggaggaattg | 1860 |
| agggcaagca | cccaggactg | atgaggtctt | aacaaaaacc | agtgtggcaa | aaaaaaaaaa | 1920 |
| aaaaaaaaaa | aaaaatccta | aaaacaaaca | aacaaaaaaa | acaattcttc | attcagaaaa | 1980 |
| attatcttag | ggactgatat | tggtaatatt | ggtcaattta | ataatatatt | ggggcatttc | 2040 |
| cttacattgt | cttgacaaga | ttaaaatgtc | tgtgccaaaa | ttttgtattt | tatttgagga | 2100 |
| cttcttatca | aaagtaatgc | tgccaaagga | agtctaagga | attagtagtg | ttcccatcac | 2160 |
| ttgtttggag | tgtgctattc | taaaagattt | tgatttctctg | gaatgacaat | tatattttaa | 2220 |
| ctttgggtggg | ggaaagagtt | ataggaccac | agcttctact | tctgatactt | gtaaattaat | 2280 |
| cttttattgc | acttgttttg | accattaagc | tatatgttta | gaaatggcca | ttttacggaa | 2340 |
| aaattagaaa | aattctgata | atagtcgaga | ataaatgaat | taatgtttta | cttaatttat | 2400 |
| attgaactgt | caatgacaaa | taaaaattct | ttttgattat | ttttgtttt | catttaccag | 2460 |
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<210> 333

<211> 3030

<212> DNA

<213> Homo sapien

<400> 333

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| ggagagcgag | ctgggtgccc | cctagattcc | ccgccccgc | acctcatgag | ccgacctctg | 120 |
| gctccatgga | gcccggcaat | tatgccacct | tggatggagc | caaggatata | gaaggcttgc | 180 |
| tgggagcggg | agggggggcg | aatctggtcg | ccactcccc | tctgaccagc | caccagcgg | 240 |
| cgctacgct | gatgcctgct | gtcaactatg | cccccttggg | tctgccaggc | tcggcggagc | 300 |
| cgccaaagca | atgccaccca | tgccctgggg | tgccccaggg | gacgtcccca | gctcccgtgc | 360 |
| cttatggtta | ctttggaggc | gggtactact | cctgccgagt | gtcccggagc | tcgctgaaac | 420 |
| cctgtgcccc | ggcagccacc | ctggccgcgt | accccgcgga | gactcccacg | gccggggaag | 480 |

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<210> 334

<211> 2417

<212> DNA

<213> Homo sapien

<400> 334

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| tatgccagat | atatgtaaaa | gcaacctaca | agctctctaa | tcatgctcac | ctaaaagatt | 420 |
| cccgggatct | aataggctca | aagaaacttc | ttctagaaat | ataaaagaga | aaattggatt | 480 |
| atgcaaaaat | tcattattaa | tttttttcat | ccatccttta | attcagcaaa | catttatctg | 540 |
| ttgttgactt | tatgcagtat | ggccttttaa | ggattggggg | acaggtgaag | aacgggggtgc | 600 |
| cagaatgcat | cctcctacta | atgaggtcag | tacacatttg | cattttaaaa | tgccctgtcc | 660 |
| agctgggcat | ggtggatcat | gcctgtaatc | tcaacatttg | aaggccaagg | caggaggatt | 720 |
| gcttcagccc | aggagttaa | gaccagcctg | ggcaacatag | aaagacccca | tctctcaatc | 780 |
| aatcaatcaa | tgccctgtct | ttgaaaataa | aactccttaa | gaaaggttta | atgggcaggg | 840 |
| tgtggtagct | catacctata | atacagcact | ttgggaggct | gaggcaggag | gatcacttta | 900 |
| gcccgagaagt | tcaagaccag | cctgggcaac | aagtgcacac | tcattctcaat | tttttaataa | 960 |
| aatgaataca | tacataagga | aagataaaaa | gaaaagttta | atgaaagaat | acagtataaa | 1020 |
| acaaatctct | tggacctaaa | agtatttttg | ttcaagccaa | atattgtgaa | tcacctctct | 1080 |
| gtgttgagga | tacagaatat | ctaagcccag | gaaactgagc | agaaagtcca | tgtactaact | 1140 |
| aatcaacccg | aggcaaggca | aaaatgagac | taactaatca | atccgaggca | aggggcaaat | 1200 |
| tagacggaac | ctgactctgg | tctattaagc | gacaactttc | cctctgttgt | atttttcttt | 1260 |
| tattcaatgt | aaaaggataa | aaactctcta | aaactaaaaa | caatgtttgt | caggagttac | 1320 |
| aaaccatgac | caactaatta | tggggaatca | taaaatatga | ctgtatgaga | tcttgatggg | 1380 |
| ttacaaaagt | taccactgt | taatcacttt | aaacattaat | gaacttaaaa | atgaatttac | 1440 |
| ggagattgga | atgtttcttt | cctgttgtat | tagttggctc | aggctgccat | aacaaaatac | 1500 |
| cacagactgg | gaggcttaag | taacagaaat | tcatttctca | cagttctggg | ggctggaagt | 1560 |
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| tggccaccct | cccactgcgt | gctcacatga | cctctttgtg | ctcctggaaa | gagggtgtgg | 1680 |
| gggacagagg | gaaagagaag | gagagggaac | tctctgggtg | ctcgtctttc | aaggacccta | 1740 |
| acctgggcca | ctttggccca | ggcactgtgg | ggtggggggg | tgtggctgct | ctgctctgag | 1800 |
| tggccaagat | aaagcaacag | aaaaatgtcc | aaagctgtgc | agcaaagaca | agccaccgaa | 1860 |
| cagggatctg | ctcatcagtg | tggggacctc | caagtcggcc | accctggagg | caagcccca | 1920 |
| cagagcccat | gcaaggtggc | agcagcagaa | gaagggaatt | gtccctgtcc | ttggcacatt | 1980 |
| cctcaccgac | ctggtgatgc | tggacactgc | gatgaatggg | aatgtggatg | agaatatgat | 2040 |
| ggactcccag | aaaaggagac | ccagctgctc | aggtggctgc | aaatcattac | agccttcac | 2100 |
| ctggggagga | actggggggc | tggttctggg | tcagagagca | gcccagtgag | ggtgagagct | 2160 |
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| ggtactgaga | caatattgtc | ataaattcaa | tgcgccttg | tatccctttt | tcttttttat | 2340 |
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<210> 335

<211> 2984

<212> DNA

<213> Homo sapien

<400> 335

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| aatgaaacaa | cagagacagt | gaaagtttta | atacctaagt | cattcccca | gtgcatactg | 660 |
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<210> 336

<211> 147

<212> PRT

<213> Homo sapien

<400> 336

```

Pro Ser Phe Pro Thr Leu Leu Ser Arg Arg His Leu Gly Ser Tyr Leu
1          5          10          15
Leu Asp Ser Glu Asn Thr Ser Gly Ala Leu Pro Arg Leu Pro Gln Thr
20          25          30
Pro Lys Gln Pro Gln Lys Arg Ser Arg Ala Ala Phe Ser His Thr Gln
35          40          45
Val Ile Glu Leu Glu Arg Lys Phe Ser His Gln Lys Tyr Leu Ser Ala
50          55          60
Pro Glu Arg Ala His Leu Ala Lys Asn Leu Lys Leu Thr Glu Thr Gln
65          70          75          80

```

Val Lys Ile Trp Phe Gln Asn Arg Arg Tyr Lys Thr Lys Arg Lys Gln
 85 90 95
 Leu Ser Ser Glu Leu Gly Asp Leu Glu Lys His Ser Ser Leu Pro Ala
 100 105 110
 Leu Lys Glu Glu Ala Phe Ser Arg Ala Ser Leu Val Ser Val Tyr Asn
 115 120 125
 Ser Tyr Pro Tyr Tyr Pro Tyr Leu Tyr Cys Val Gly Ser Trp Ser Pro
 130 135 140
 Ala Phe Trp
 145

<210> 337
 <211> 9
 <212> PRT
 <213> Homo sapien

<400> 337
 Ala Leu Thr Gly Phe Thr Phe Ser Ala
 1 5

<210> 338
 <211> 9
 <212> PRT
 <213> Homo sapien

<400> 338
 Leu Leu Ala Asn Asp Leu Met Leu Ile
 1 5

<210> 339
 <211> 318
 <212> PRT
 <213> Homo sapien

<400> 339
 Met Val Glu Leu Met Phe Pro Leu Leu Leu Leu Leu Pro Phe Leu
 1 5 10 15
 Leu Tyr Met Ala Ala Pro Gln Ile Arg Lys Met Leu Ser Ser Gly Val
 20 25 30
 Cys Thr Ser Thr Val Gln Leu Pro Gly Lys Val Val Val Val Thr Gly
 35 40 45
 Ala Asn Thr Gly Ile Gly Lys Glu Thr Ala Lys Glu Leu Ala Gln Arg
 50 55 60
 Gly Ala Arg Val Tyr Leu Ala Cys Arg Asp Val Glu Lys Gly Glu Leu
 65 70 75 80
 Val Ala Lys Glu Ile Gln Thr Thr Thr Gly Asn Gln Gln Val Leu Val
 85 90 95
 Arg Lys Leu Asp Leu Ser Asp Thr Lys Ser Ile Arg Ala Phe Ala Lys
 100 105 110
 Gly Phe Leu Ala Glu Glu Lys His Leu His Val Leu Ile Asn Asn Ala
 115 120 125
 Gly Val Met Met Cys Pro Tyr Ser Lys Thr Ala Asp Gly Phe Glu Met
 130 135 140
 His Ile Gly Val Asn His Leu Gly His Phe Leu Leu Thr His Leu Leu

145 150 155 160
 Leu Glu Lys Leu Lys Glu Ser Ala Pro Ser Arg Ile Val Asn Val Ser
 165 170 175
 Ser Leu Ala His His Leu Gly Arg Ile His Phe His Asn Leu Gln Gly
 180 185 190
 Glu Lys Phe Tyr Asn Ala Gly Leu Ala Tyr Cys His Ser Lys Leu Ala
 195 200 205
 Asn Ile Leu Phe Thr Gln Glu Leu Ala Arg Arg Leu Lys Gly Ser Gly
 210 215 220
 Val Thr Thr Tyr Ser Val His Pro Gly Thr Val Gln Ser Glu Leu Val
 225 230 235 240
 Arg His Ser Ser Phe Met Arg Trp Met Trp Trp Leu Phe Ser Phe Phe
 245 250 255
 Ile Lys Thr Pro Gln Gln Gly Ala Gln Thr Ser Leu His Cys Ala Leu
 260 265 270
 Thr Glu Gly Leu Glu Ile Leu Ser Gly Asn His Phe Ser Asp Cys His
 275 280 285
 Val Ala Trp Val Ser Ala Gln Ala Arg Asn Glu Thr Ile Ala Arg Arg
 290 295 300
 Leu Trp Asp Val Ser Cys Asp Leu Leu Gly Leu Pro Ile Asp
 305 310 315

<210> 340
 <211> 483
 <212> DNA
 <213> Homo sapien

<400> 340
 gccgaggtct gccttcacac ggaggacacg agactgcttc ctcaagggct cctgcctgcc 60
 tggacactgg tgggagggcg tgttttagttg gctgttttca gaggggtctt tcggagggac 120
 ctcttgctgc aggtctggagt gtctttattc ctggcgggag accgcacatt cactgctga 180
 gggtgtgggg gcggtttatc aggcagtgat aaacataaga tgtcatttcc ttgactccgg 240
 ccttcaattt tctctttggc tgacgacgga gtccgtggtg tcccgatgta actgacccct 300
 gctccaaacg tgacatcact gatgctcttc tcgggggtgc tgatggcccg cttggtcacg 360
 tgctcaatct cgccattcga ctcttgctcc aaactgtatg aagacacctg actgcacgtt 420
 ttttctgggc ttccagaatt taaagtgaag ggcagcactc ctaagctccg actccgatgc 480
 ctg 483

<210> 341
 <211> 344
 <212> DNA
 <213> Homo sapien

<400> 341
 ctgctgctga gtcacagatt tcattataaa tagcctccct aaggaaaata cactgaatgc 60
 tatttttact aaccattcta tttttataga aatagctgag agtttctaaa ccaactctct 120
 gctgccttac aagtattaaa tattttactt ctttccataa agagtagctc aaaatattga 180
 attaatttaa taattttctga tgatggtttt atctgcagta atatgtatat catctattag 240
 aattttacta atgaaaaact gaagagaaca aaatttgtaa ccactagcac ttaagtactc 300
 ctgattctta acattgtctt taatgaccac aagacaacca acag 344

<210> 342
 <211> 592
 <212> DNA
 <213> Homo sapien

<400> 342

| | | | | | | |
|------------|-------------|------------|------------|------------|-------------|-----|
| acagcaaaaa | agaaactgag | aagcccaaty | tgctttcttg | ttaacatcca | cttatccaac | 60 |
| caatgtggaa | acttcttata | cttggttcca | ttatgaagt | ggacaattgc | tgctatcaca | 120 |
| cctggcaggt | aaaccaatgc | caagagagtg | atggaaacca | ttggcaagac | tttggtgatg | 180 |
| accaggattg | gaattttata | aaaatattgt | tgatgggaag | ttgctaaagg | gtgaattact | 240 |
| tccctcagaa | gagtgtaaag | aaaagtcaga | gatgctataa | tagcagctat | tttaattggc | 300 |
| aagtgccact | gtggaaagag | ttcctgtgtg | tgctgaagtt | ctgaagggca | gtcaaattca | 360 |
| tcagcatggg | ctgtttgggtg | caaagcaaaa | agcacaggtc | tttttagcat | gctgggtctct | 420 |
| cccgtgtcct | tatgcaaata | atcgtcttct | tctaaatttc | tcctaggctt | cattttccaa | 480 |
| agttcttctt | ggtttgtgat | gtcttttctg | ctttccatta | attctataaa | atagtatggc | 540 |
| ttcagccacc | cactcttcgc | cttagcttga | ccgtgagtct | cggctgccgc | tg | 592 |

<210> 343

<211> 382

<212> DNA

<213> Homo sapien

<400> 343

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|-----|
| ttcttgacct | cctcctcctt | caagctcaaa | caccacctcc | cttattcagg | accggcactt | 60 |
| cttaatgttt | gtggctttct | ctccagcctc | tcttaggagg | ggtaatggtg | gagttggcat | 120 |
| cttgtaactc | tcctttctcc | tttcttcccc | tttctctgcc | cgctttcccc | atctgtctgt | 180 |
| agactttctt | attgtcagtc | tgtgtcacat | ccagtgattg | ttttggtttc | tgttcccttt | 240 |
| ctgactgccc | aagggggtca | gaacccccagc | aatcccttcc | tttactacc | ttcttttttg | 300 |
| ggggtagttg | gaagggactg | aaattgtggg | gggaaggtag | gaggcacatc | aataaagagg | 360 |
| aaaccaccaa | gctgaaaaaa | aa | | | | 382 |

<210> 344

<211> 536

<212> DNA

<213> Homo sapien

<400> 344

| | | | | | | |
|------------|------------|------------|------------|-------------|------------|-----|
| ctgggcctga | agctgtaggg | taaatcagag | gcaggcttct | gagtgatgag | agtcctgaga | 60 |
| caataggcca | cataaacttg | gctggatgga | acctcacaat | aagggtggtca | cctcttgttt | 120 |
| gtttaggggg | atgccaagga | taaggccagc | tcagttatat | gaagagaagc | agaacaaaca | 180 |
| agtctttcag | agaaatggat | gcaatcagag | tgggatcccc | gtcacatcaa | ggtcacactc | 240 |
| caccttcatt | tgcttgaatg | gttgccaggt | cagaaaaatc | caccttctac | gagtggggct | 300 |
| tcgaccctat | atcccccgcc | cgcgtccctt | tctccataaa | attcttctta | gtagctatta | 360 |
| ccttcttatt | atttgatcta | gaaattgccc | tccttttacc | cctaccatga | gccctacaaa | 420 |
| caactaacct | gccactaata | gttatgtcat | ccctcttatt | aatcatcatc | ctagccctaa | 480 |
| gtctggccta | tgagtgacta | caaaaaggat | tagactgagc | cgaataacaa | aaaaaa | 536 |

<210> 345

<211> 251

<212> DNA

<213> Homo sapien

<400> 345

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| accttttgag | gtctctctca | ccacctccac | agccaccgtc | accgtgggat | gtgctggatg | 60 |
| tgaatgaagc | ccccatcttt | gtgcctcctg | aaaagagagt | ggaagtgtcc | gaggactttg | 120 |
| gcgtgggcca | ggaaatcaca | tcctacactg | cccaggagcc | agacacattt | atggaacaga | 180 |
| aaataacata | tcggatttgg | agagacactg | ccaactggct | ggagattaat | ccggacactg | 240 |
| gtgccatttc | c | | | | | 251 |

<210> 346
 <211> 282
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(282)
 <223> n = A,T,C or G

<400> 346
 cgcgtctctg acactgtgat catgacaggg gttcaaacag aaagtgcctg ggccctcctt 60
 ctaagtcttg ttaccaaaaa aaggaaaaag aaaagatctt ctcagttaca aattctggga 120
 agggagacta tacctggctc ttgccctaag tgagaggtct tccctcccgc accaaaaaat 180
 agaaaggctt tctatttcac tggcccaggt agggggaagg agagtaactt tgagtctgtg 240
 ggtctcattt cccaaggtgc cttcaatgct catnaaaacc aa 282

<210> 347
 <211> 201
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(201)
 <223> n = A,T,C or G

<400> 347
 acacacataa tattataaaa tgccatctaa ttggaaggag ctttctatca ttgcaagtca 60
 taaatataac ttttaaaaaa ntactancag cttttaccta ngctccataa tgcttgtaaa 120
 tctgagactg actggaccca cccagaccca gggcaaagat acatgttacc atatcatctt 180
 tataaagaat ttttttttgt c 201

<210> 348
 <211> 251
 <212> DNA
 <213> Homo sapien

<400> 348
 ctgttaatca caacatttgt gcatacttg tgccaagtga gaaaatgttc taaaatcaca 60
 agagagaaca gtgccagaat gaaactgacc ctaagtcca ggtgccctg ggcaggcaga 120
 aggagacact cccagcatgg aggagggtt atcttttcat cctaggtcag gtctacaatg 180
 ggggaagggt ttattataga actccaaca gccacactca ctctgccac ccaccgatg 240
 gccctgcctc c 251

<210> 349
 <211> 251
 <212> DNA
 <213> Homo sapien

<400> 349
 taaaaatcaa gccatttaat tgtatctttg aaggtaaaca atatatggga gctggatcac 60
 aacccctgag gatgccagag ctatgggtcc agaacatggg gtggtattat caacagagtt 120
 cagaagggtc tgaactctac gtgttaccag agaacataat gcaattcatg cattccactt 180
 agcaattttg taaaatacca gaaacagacc ccaagagtct ttcaagatga ggaaaattca 240

actcctgggtt t

251

<210> 350

<211> 908

<212> DNA

<213> Homo sapien

<400> 350

| | | | | | | |
|-------------|------------|-------------|-------------|-------------|------------|-----|
| ctggacactt | tgcgagggct | tttgctgggt | gctgctgctg | cccgtcatgc | tactcatcgt | 60 |
| agcccccccg | gtgaagctcg | ctgctttccc | tacctcctta | agtgactgcc | aaacgcccac | 120 |
| cggctggaat | tgctctgggt | atgatgacag | agaaaatgat | ctcttcctct | gtgacaccaa | 180 |
| cacctgtaaa | tttgatgggg | aatgtttaag | aattggagac | actgtgactt | gcgtctgtca | 240 |
| gttcaagtgc | aacaatgact | atgtgcctgt | gtgtggctcc | aatggggaga | gctaccagaa | 300 |
| tgagtgttac | ctgcgacagg | ctgcatgcaa | acagcagagt | gagatacttg | tggtgtcaga | 360 |
| aggatcatgt | gccacagtcc | atgaaggctc | tggagaaact | agtcaaaagg | agacatccac | 420 |
| ctgtgatatt | tgccagtttg | gtgcagaatg | tgacgaagat | gccgaggatg | tctggtgtgt | 480 |
| gtgtaattatt | gactgttctc | aaaccaactt | caatccccctc | tgcgttctctg | atgggaaatc | 540 |
| ttatgataat | gcatgccaaa | tcaaagaagc | atcgtgtcag | aaacaggaga | aaattgaagt | 600 |
| catgtctttg | ggctgatgtc | aagataaacac | aactacaact | actaagtctg | aagatgggca | 660 |
| ttatgcaaga | acagattatg | cagagaatgc | taacaaatta | gaagaaagtg | ccagagaaca | 720 |
| ccacatacct | tgtccggaac | attacaatgg | cttctgcatg | catgggaagt | gtgagcattc | 780 |
| tatcaatatg | caggagccat | cttgcagggtg | tgatgctggt | tatactggac | aacactgtga | 840 |
| aaaaaaggac | tacagtgttc | tatacgttgt | tcccggctct | gtacgatttc | agtatgtctt | 900 |
| aatcgacg | | | | | | 908 |

<210> 351

<211> 472

<212> DNA

<213> Homo sapien

<400> 351

| | | | | | | |
|-------------|-------------|------------|-------------|------------|------------|-----|
| ccagttatatt | gcaagtggta | agagcctatt | taccataaat | aatactaaga | accaactcaa | 60 |
| gtcaaacctt | aatgccattg | ttattgtgaa | ttaggattaa | gtagtaattt | tcaaaattca | 120 |
| cattaacttg | attttaaaat | cagwtttgyg | agtcattttac | cacaagctaa | atgtgtacac | 180 |
| tatgataaaa | acaaccattg | tattcctgtt | tttctaaaca | gtcctaattt | ctaactgtt | 240 |
| atatatcctt | cgacatcaat | gaactttgtt | ttcttttact | ccagtaataa | agtaggcaca | 300 |
| gatctgtcca | caacaaactt | gccctctcat | gccttgccctc | tcaccatgct | ctgctccagg | 360 |
| tcagccccct | tttggcctgt | ttgttttgtc | aaaaacctaa | tctgcttctt | gcttttcttg | 420 |
| gtaatatata | tttaggggaag | atgttgcttt | gccacacac | gaagcaaagt | aa | 472 |

<210> 352

<211> 251

<212> DNA

<213> Homo sapien

<400> 352

| | | | | | | |
|------------|-------------|------------|------------|------------|-------------|-----|
| ctcaaagcta | atctctcggg | aatcaaacca | gaaaagggca | aggatcttag | gcatgggtgga | 60 |
| tgtggataag | gccagggtcaa | tggctgcaag | catgcagaga | aagaggtaca | tcggagcgtg | 120 |
| caggctgcgt | tccgtcctta | cgatgaagac | cacgatgcag | tttccaaaca | ttgccactac | 180 |
| atacatggaa | aggaggggga | agccaacca | gaaatgggct | ttctctaate | ctgggatacc | 240 |
| aataagcaca | a | | | | | 251 |

<210> 353

<211> 436

<212> DNA

<213> Homo sapien

<400> 353

| | |
|---|-----|
| tttttttttt tttttttttt tttttttacaa caatgcagtc atttatttat tgagtatgtg | 60 |
| cacattatgg tattattact atactgatta tttttatcat gtgacttcta attaraaaat | 120 |
| gtatccaaaa gcaaaacagc agatatacaa aattaaagag acagaagata gacattaaca | 180 |
| gataaggcaa cttatacatt gacaatccaa atccaatata tttaaacatt tgggaaatga | 240 |
| ggggggacaaa tggaagccar atcaaatttg tgtaaaacta ttcagtatgt ttccttctgct | 300 |
| tcattgtctga raaggctctc ccttcaatgg ggatgacaaa ctccaaatgc cacacaaatg | 360 |
| ttaacagaat actagattca cactggaacg ggggtaaaaga agaaattatt ttctataaaa | 420 |
| gggctcctaa tgtagt | 436 |

<210> 354

<211> 854

<212> DNA

<213> Homo sapien

<400> 354

| | |
|--|-----|
| ccttttctag ttcaccagtt ttctgcaagg atgctgggta gggagtgtct gcaggaggag | 60 |
| caagtctgaa accaaatcta ggaacatag gaaacgagcc aggcacaggg ctgggtgggcc | 120 |
| atcagggacc accctttggg ttgatatttt gcttaatctg catcttttga gtaagatcat | 180 |
| ctggcagtag aagctgttct ccaggtagat ttctctagct catgtacaaa aacatcctga | 240 |
| aggactttgt caggtgcctt gctaaaagcc agatgcgttc ggcacttcct tggctctgagg | 300 |
| ttaattgcac acctacaggc actgggctca tgctttcaag ttttttgtcc tcactttagg | 360 |
| gtgagtgaat gatccccatt ataggagcac ttgggagaga tcatataaaa gctgactctt | 420 |
| gagtacatgc agtaatgggg tagatgtgtg ttggtgtgtc tcattcctgc aagggtgctt | 480 |
| gttagggagt gtttccagga ggaacaagtc tgaaaccaat catgaaataa atggtaggtg | 540 |
| tgaactggaa aactaattca aaagagagat cgtgatatca gtgtgggtga tacaccttg | 600 |
| caatatggaa ggctctaatt tgcccatatt tgaaataata attcagcttt ttgtaataca | 660 |
| aaataacaaa ggattgagaa tcatgggtgc taatgtataa aagaccagc aaacataaat | 720 |
| atatcaactg cataaatgta aaatgcatgt gacccaagaa ggccccaag tggcagacaa | 780 |
| cattgtaccc attttccctt ccaaaatgtg agcggcgggc ctgctgcttt caaggctgtc | 840 |
| acacgggatg tcag | 854 |

<210> 355

<211> 676

<212> DNA

<213> Homo sapien

<400> 355

| | |
|--|-----|
| gaaattaagt atgagctaaa ttcctgttta aaacctctag gggtagacaga tctcttcaac | 60 |
| caggtcaaaag ctgatctttc tggaatgtca ccaaccaagg gcctatatatt atcaaaaagcc | 120 |
| atccacaagt catacctgga tgtcagcgaa gagggcacgg aggcagcagc agccactggg | 180 |
| gacagcatcg ctgtaaaaag cctaccaatg agagctcagt tcaaggcgaa ccacctctt | 240 |
| ctgttcttta taaggcacac tcataccaac acgacccat tctgtggcaa gcttgccctt | 300 |
| ccctaattcag atgggggtga gtaaggctca gagttagcaga tgaggtagcag agacaatcct | 360 |
| gtgactttcc cacggccaaa aagctgttca cacctcacgc acctctgtgc ctgagtttgc | 420 |
| tcattctgaa aatagggtct ggatttcttc caacctttc atgagttgtg aagctaaggc | 480 |
| tttggttaatc atggaaaaag gtagacttat gcagaaagcc tttctggctt tcttatctgt | 540 |
| ggtgtctcat ttgagtgtg tccagtgaac tgatcaagtc aatgagtaaa attttaaggg | 600 |
| attagatttt ctgacttgt atgtatctgt gagatcttga ataagtgacc tgacatctct | 660 |
| gcttaaaagaa aaccag | 676 |

<210> 356

<211> 574

<212> DNA

<213> Homo sapien

<400> 356

| | | | | | | |
|------------|------------|------------|-------------|-------------|------------|-----|
| tttttttttt | tttttcagga | aaacattctc | ttactttatt | tgcattctcag | caaaggttct | 60 |
| catgtggcac | ctgactggca | tcaaaccaaa | gttcgttaggc | caacaaagat | gggccactca | 120 |
| caagcttccc | attttagat | ctcagtgcct | atgagtatct | gacacctgtt | cctctcttca | 180 |
| gtctcttagg | gaggcttaaa | tctgtctcag | gtgtgctaag | agtgccagcc | caaggkgtc | 240 |
| aaaagtccac | aaaactgcag | tctttgctgg | gatagtaagc | caagcagtgc | ctggacagca | 300 |
| gagttctttt | cttgggcaac | agataaccag | acaggactct | aatcgtgctc | ttattcaaca | 360 |
| ttcttctgtc | tctgcctaga | ctggaataaa | aagccaatct | ctctcgtggc | acaggggaag | 420 |
| agatacaagc | tcgtttacat | gtgatagatc | taacaaaggc | atctaccgaa | gtctggtctg | 480 |
| gatagacggc | acagggagct | cttaggtcag | cgctgctggg | tggaggacat | tcctgagtcc | 540 |
| agctttgcag | cctttgtgca | acagtacttt | ccca | | | 574 |

<210> 357

<211> 393

<212> DNA

<213> Homo sapien

<400> 357

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| tttttttttt | tttttttttt | tttttttttt | tacagaatat | aratgcttta | tcactgkact | 60 |
| taatatggkg | kcttggtcac | tatacttaaa | aatgcaccac | tcataaatat | ttaattcagc | 120 |
| aagccacaac | caaracttga | ttttatcaac | aaaaaccctt | aaatataaac | ggsaaaaaag | 180 |
| atagatataa | ttattccagt | ttttttaaaa | cttaaaarat | attccattgc | cgaattaara | 240 |
| araarataag | tggttatatg | aaagaagggc | attcaagcac | actaaaraaa | cctgaggkaa | 300 |
| gcataatctg | tacaaaatta | aactgtcctt | tttggcattt | taacaaattt | gcaacgktct | 360 |
| tttttttctt | tttctgtttt | tttttttttt | tac | | | 393 |

<210> 358

<211> 630

<212> DNA

<213> Homo sapien

<400> 358

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| acagggtaaa | caggaggatc | cttgctctca | cggagcttac | attctagcag | gaggacaata | 60 |
| ttaatgttta | taggaaaatg | atgagtttat | gacaaaggaa | gtagatagtg | ttttacaaga | 120 |
| gcatagagta | gggaagctaa | tccagcacag | ggaggtcaca | gagacatccc | taaggaagtg | 180 |
| gagtttaaac | tgagagaagc | aagtgcctaa | actgaaggat | gtgttgaaga | agaagggaga | 240 |
| gtagaacaat | ttgggcagag | ggaaccttat | agaccctaag | gtgggaaggt | tcaaagaact | 300 |
| gaaagagagc | tagaacagct | ggagccgttc | tccggtgtaa | agaggagtca | aagagataag | 360 |
| attaaagatg | tgaagattaa | gatcttggtg | gcatttcagg | attggcactt | ctacaagaaa | 420 |
| tcactgaagg | gagtaatgtg | acattacttt | tcatttcagg | atggccattc | taactccagg | 480 |
| gggtagactg | gactaggtaa | gactggaggc | aggtagacct | cttctaaggc | ctgcgatagt | 540 |
| gaaagacaaa | aataagtggg | gaaattcagg | ggatagtga | aatcagtagg | acttaatgag | 600 |
| caagccagag | gttcctccac | aacaaccagt | | | | 630 |

<210> 359

<211> 620

<212> DNA

<213> Homo sapien

<400> 359

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| acagcattcc | aaaatatata | tctagagact | aarrgtaaat | gctctatagt | gaagaagtaa | 60 |
| taattaaaaa | atgctactaa | tatagaaaat | ttataatcag | aaaaataaat | attcaggag | 120 |

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| ctcaccagaa | gaataaagtg | ctctgccagt | tattaaagga | ttactgctgg | tgaattaaat | 180 |
| atggcattcc | ccaagggaaa | tagagagatt | cttctggatt | atgttcaata | tttatttcac | 240 |
| aggattaact | gttttaggaa | cagatataaa | gcttcgccac | ggaagagatg | gacaaagcac | 300 |
| aaagacaaca | tgatacctta | ggaagcaaca | ctaccctttc | aggcataaaa | tttgagaaa | 360 |
| tgcaacatta | tgcttcatga | ataatatgta | gaaagaagg | ctgatgaaaa | tgacatcctt | 420 |
| aatgtaagat | aactttataa | gaattctggg | tcaaataaaa | ttctttgaag | aaaacatcca | 480 |
| aatgtcattg | acttatcaaa | tactatcttg | gcataatacc | tatgaaggca | aaactaaaca | 540 |
| aacaaaaagc | tcacaccaa | caaaaccatc | aacttatttt | gtattctata | acatacgaga | 600 |
| ctgtaaagat | gtgacagtgt | | | | | 620 |

<210> 360

<211> 431

<212> DNA

<213> Homo sapien

<400> 360

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| aaaaaaaaa | agccagaaca | acatgtgata | gataaatga | ttggctgcac | acttccagac | 60 |
| tgatgaatga | tgaacgtgat | ggactattgt | atggagcaca | tcttcagcaa | gagggggaaa | 120 |
| tactcatcat | ttttggccag | cagttgtttg | atcaccaaac | atcatgccag | aatactcagc | 180 |
| aaaccttctt | agctcttgag | aagtcaaagt | ccgggggaat | ttattcctgg | caattttaat | 240 |
| tggactcctt | atgtgagagc | agcggctacc | cagctggggt | ggtggagcga | accgcgcact | 300 |
| agtggacatg | cagtggcaga | gctcctggta | accacctaga | ggaatacaca | ggcacatgtg | 360 |
| tgatgccaag | cgtgacacct | gtagcactca | aatttgtctt | gtttttgtct | ttcgggtgtg | 420 |
| agattcttag | t | | | | | 431 |

<210> 361

<211> 351

<212> DNA

<213> Homo sapien

<400> 361

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| acactgattt | ccgatcaaaa | gaatcatcat | ctttaccttg | acttttcagg | gaattactga | 60 |
| actttcttct | cagaagatag | ggcacagcca | ttgccttggc | ctcacttgaa | gggtctgcat | 120 |
| ttgggtctct | tgggtctctg | ccaagtttcc | cagccactcg | agggagaaat | atcgggaggt | 180 |
| ttgacttcct | ccggggcttt | cccaggggct | tcaccgtgag | ccctgcggcc | ctcagggctg | 240 |
| caatcctgga | ttcaatgtct | gaaacctcgc | tctctgcctg | ctggacttct | gaggccgtca | 300 |
| ctgccactct | gtcctccagc | tctgacagct | cctcatctgt | ggtcctgttg | t | 351 |

<210> 362

<211> 463

<212> DNA

<213> Homo sapien

<400> 362

| | | | | | | |
|------------|------------|------------|-------------|-------------|------------|-----|
| acttcatcag | gccataatgg | gtgcctcccg | tgagaatcca | agcacctttg | gactgcgcga | 60 |
| tgtagatgag | ccggctgaag | atcttgcgca | tgcgcggctt | cagggcgaag | ttcttggcgc | 120 |
| ccccggctac | agaaatgacc | aggttgggtg | ttttcaggtg | ccagtgtctg | gtcagcagct | 180 |
| cgtaaaggat | ttccgcgtcc | gtgtcgcagg | acagacgtat | atacttcctt | ttcttcccca | 240 |
| gtgtctcaaa | ctgaatatcc | ccaaaggcgt | cggtaggaaa | ttccttgggtg | tgtttcttgt | 300 |
| agttccattt | ctcacttttg | ttgatctggg | tgccttccat | gtgctggctc | tgggcatagc | 360 |
| cacacttgca | cacattctcc | ctgataagca | cgatgggtgtg | gacaggaagg | aaggatttca | 420 |
| ttgagcctgc | ttatggaaac | tggtattggt | agcttaaata | gac | | 463 |

<210> 363

<211> 653

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(653)

<223> n = A,T,C or G

<400> 363

```

acccccgagt ncctgnctgg catactgnga acgaccaacg acacacccaa gctcggcctc      60
ctcttgngga ttctgggtga catcttcatg aatggcaacc gtgccagwga ggctgtcctc      120
tgaggagcac tacgcaagat gggactgcgt cctgggggtga gacatcctct ccttggagat      180
ctaacgaaac ttctcaccta tgagttgtaa agcagaaata cctgnactac agacgagtgc      240
ccaacagcaa ccccccgaa gtatgagttc ctctrgggcc tccgttccta ccatgagasc      300
tagcaagatg naagtgttga gantcattgc agaggttcag aaaagagacc cntcgtgact      360
ggtctgcaca gttcatggag gctgcagatg aggccttggg tgctctggat gctgctgcag      420
ctgaggccga agcccgggct gaagcaagaa cccgcctggg aattggagat gaggctgtgt      480
ntgggccctg gagctgggat gacattgagt ttgagctgct gacctgggat gaggaaggag      540
atcttgagga tccttgggcc agaattccat ttaccttctg ggccagatac caccagaatg      600
cccgctccag attcctcag acctttgccg gtcccattat tggctstggt ggt              653

```

<210> 364

<211> 401

<212> DNA

<213> Homo sapien

<400> 364

```

actagaggaa agacgttaaa cactctact accacttgtg gaactctcaa agggtaaagt      60
acaaagccaa tgaatgactc taaaaacaat atttacattt aatggtttgt agacaataaa      120
aaaacaaggt ggatagatct agaattgtaa cattttaaga aaaccatagc atttgacaga      180
tgagaaaagct caattataga tgcaaagtta taactaaact actatagtag taaagaaata      240
catttcacac cttcatata aattcactat cttggcttga ggcactccat aaaatgtatc      300
acgtgcatag taaatcttta tatttgctat ggcgttgac tagaggactt ggactgcaac      360
aagtggatgc gcggaaaatg aaatcttctt caatagccca g              401

```

<210> 365

<211> 356

<212> DNA

<213> Homo sapien

<400> 365

```

ccagtgtcat atttgggctt aaaatttcaa gaagggcact tcaaattggct ttgcatttgc      60
atgtttcagt gctagagcgt aggaatagac cctggcgctc actgtgagat gttcttcagc      120
taccagagca tcaagtctct gcagcaggtc attcttgggt aaagaaatga cttccacaaa      180
ctctccatcc cctggctttg gcttcggcct tgcgttttcg gcatcatctc cgtaaatggt      240
gactgtcacg atgtgtatag tacagtttga caagcctggg tccatacaga ccgctggaga      300
acattcggca atgtccctt tgtagccagt ttcttcttcg agctcccga gagcag          356

```

<210> 366

<211> 1851

<212> DNA

<213> Homo sapien

<400> 366

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tcataccat tgccagcagc ggcaccgtta gtcaggtttt ctgggaatcc cacatgagta      60

```

```

cttccgtgtt cttcattctt cttcaatagc cataaatctt ctagctctgg ctggctgttt 120
tcacttcctt taagcctttg tgactcttcc tctgatgtca gctttaagtc ttgttctgga 180
ttgctgtttt cagaagagat ttttaacatc tgtttttctt tgtagtcaga aagtaactgg 240
caaattacat gatgatgact agaaacagca tactctctgg ccgtctttcc agatcttgag 300
aagatacatc aacattttgc tcaagtagag ggctgactat acttgctgat ccacaacata 360
cagcaagtat gagagcagtt cttccatatc tatccagcgc atttaaattc gcttttttct 420
tgattaaaaa tttcaccact tgctgttttt gctcatgtat accaagtagc agtgggtgtga 480
ggccatgctt gttttttgat tcatatcag caccgtataa gagcagtgtt ttggccatta 540
atztatcttc attgtagaca gcatagtgtg gagtgggtatt tccatactca tctggaatat 600
ttggatcagt gccatgttcc agcaacatta acgcacattc atcttcttgg cattgtacgg 660
cctttgtcag agctgtcttc tttttgttgt caaggacatt aagttgacat cgtctgtcca 720
gcacgagttt tactacttct gaattcccat tggcagaggc cagatgtaga gcagtcctct 780
tttgcctgtc cctctgttcc acatccgtgt ccctgagcat gacgatgaga tccctttctgg 840
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acctgggac ccatgaaggcg ctgtcatcgt agtctcccca agcgaccacg ttgctcttgc 960
cgctcccctg cagcagggga agcagtggca gcaccacttg cacctcttgc tcccaagcgt 1020
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acagaggatg agatccagaa accacaatat ccattcacia acaaacactt ttcagccaga 1260
cacaggtact gaaatcatgt catctgcggc aacatgggtg aacctaccca atcacacatc 1320
aagagatgaa gacactgcag tatatctgca caacgtataa ctcttcatcc ataacaaaat 1380
aatataatth tctcttgag ccataatggat gaactatgaa ggaagaactc ccgaagaag 1440
ccagtcgcag agaagccaca ctgaagctct gtccctcagcc atcagcgcca cggacaggat 1500
tgtgtttctt cccagtgat gcagcctcaa gttatcccga agctgcgcga gcacacgggtg 1560
gtccttgaga aacaccccag ctcttccggg ctaacacagg caagtcaata aatgtgataa 1620
tcacataaac agaattaaaa gcaaagtcac ataagcatct caacagacac agaaaaggca 1680
tttgacaaaa tccagcatcc ttgtattht tggtgcagtt ctacagaggaa atgcttctaa 1740
cttttcccca tttagtatta tggtgggtgt gggtctgtca taggtggttt ttattacttt 1800
aaggtatgtc ctttctatgc ctgttttgct gaggggtttta attctcgtgc c 1851

```

<210> 367

<211> 668

<212> DNA

<213> Homo sapien

<400> 367

```

cttgagcttc caaataygga agactgcccc ttacacasgt caatgttaaa atgaatgcat 60
ttcagtatth tgaagataaa attrgtagat ctataccttg ttttttgatt cgatatcagc 120
accrtataag agcagtgtt tggccattaa tttatcttcc attrtagaca gortagtgya 180
gagtgggtatt tccatactca tctggaatat ttggatcagt gccatgttcc agcaacatta 240
acgcacattc atcttcttgg cattgtacgg cctgtcagta ttagacccaa aaacaaatta 300
catatcttag gaattcaaaa taacattcca cagctttcac caactagtta tatttaaagg 360
agaaaactca tttttatgcc atgtattgaa atcaaaccca cctcatgctg atatagtgtg 420
ctactgcata cctttatcag agctgtcttc tttttgttgt caaggacatt aagttgacat 480
cgtctgtcca gcaggagttt tactacttct gaattcccat tggcagaggc cagatgtaga 540
gcagtcctat gagagtgaga agacttttta ggaaattgta gtgcactagc tacagccata 600
gcaatgattc atgtaactgc aaacactgaa tagcctgcta ttactctgcc ttcaaaaaaa 660
aaaaaaa

```

<210> 368

<211> 1512

<212> DNA

<213> Homo sapien

<400> 368

| | | | | | | |
|-------------|-------------|------------|-------------|-------------|------------|------|
| gggtcgccca | ggggsgcgt | gggctttcct | cgggtgggtg | tgggttttcc | ctgggtgggg | 60 |
| tgggctgggc | trgaatcccc | tgctgggggt | ggcagggtttt | ggctgggatt | gacttttytc | 120 |
| ttcaaacaga | ttggaaaccc | ggagttacct | gctagttggg | gaaactgggt | ggtagacgcg | 180 |
| atctgttggc | tactactggc | ttctcctggc | tgtaaaaagc | agatgggtgg | tgaggttgat | 240 |
| tccatgccgg | ctgctttctc | tgtgaagaag | ccatttggtc | tcaggagcaa | gatgggcaag | 300 |
| tggtgctgcc | gttgctttccc | ctgctgcagg | gagagcggca | agagcaacgt | gggcacttct | 360 |
| ggagaccacg | acgactctgc | tatgaagaca | ctcaggagca | agatgggcaa | gtggtgccgc | 420 |
| cactgcttcc | cctgctgcag | ggggagtggc | aagagcaacg | tgggcgcttc | tggagaccac | 480 |
| gacgaytctg | ctatgaagac | actcaggaac | aagatgggca | agtgggtgctg | ccactgcttc | 540 |
| ccctgctgca | gggggagcrg | caagagcaag | gtgggcgctt | ggggagacta | cgatgacagt | 600 |
| gccttcatgg | agcccaggta | ccacgtccgt | ggagaagatc | tggacaagct | ccacagagct | 660 |
| gcctgggtggg | gtaaaagtc | cagaaaggat | ctcatcgta | tgctcaggga | cactgacgtg | 720 |
| aacaagaagg | acaagcaaaa | gaggactgct | ctacatctgg | cctctgccaa | tgggaattca | 780 |
| gaagtagtaa | aactcstgct | ggacagacga | tgtcaactta | atgtccttga | caacaaaaag | 840 |
| aggacagctc | tgayaaaggc | cgtacaatgc | caggaagatg | aatgtgcgtt | aatgttgctg | 900 |
| gaacatggca | ctgatccaaa | tattccagat | gagtatggaa | ataccactct | rcactaygct | 960 |
| rtctayaatg | aagataaatt | aatggccaaa | gcactgctct | tatayggtgc | tgatatcgaa | 1020 |
| tcaaaaaaca | aggtatagat | ctactaattt | tatcttcaaa | atactgaaat | gcattcattt | 1080 |
| taacattgac | gtgtgtaagg | gccagtcttc | cgtatttgga | agctcaagca | taacttgaat | 1140 |
| gaaaatattt | tgaaatgacc | taattatctm | agactttatt | ttaaatattg | ttattttcaa | 1200 |
| agaagcatta | gagggtacag | tttttttttt | ttaaatgcac | ttctggtaaa | tacttttgtt | 1260 |
| gaaaacactg | aatttgtaaa | aggtaatact | tactattttt | caatttttcc | ctcctaggat | 1320 |
| ttttttcccc | taatgaatgt | aagatggcaa | aatttgccct | gaaatagggt | ttacatgaaa | 1380 |
| actccaagaa | aagttaaaca | tgtttcagtg | aatagagatc | ctgctccttt | ggcaagttcc | 1440 |
| taaaaaacag | taatagatac | gaggtgatgc | gcctgtcagt | ggcaagggtt | aagatatttc | 1500 |
| tgatctcgtg | cc | | | | | 1512 |

<210> 369

<211> 1853

<212> DNA

<213> Homo sapien

<400> 369

| | | | | | | |
|-------------|-------------|------------|-------------|-------------|------------|------|
| gggtcgccca | ggggsgcgt | gggctttcct | cgggtgggtg | tgggttttcc | ctgggtgggg | 60 |
| tgggctgggc | trgaatcccc | tgctgggggt | ggcagggtttt | ggctgggatt | gacttttytc | 120 |
| ttcaaacaga | ttggaaaccc | ggagttacct | gctagttggg | gaaactgggt | ggtagacgcg | 180 |
| atctgttggc | tactactggc | ttctcctggc | tgtaaaaagc | agatgggtgg | tgaggttgat | 240 |
| tccatgccgg | ctgctttctc | tgtgaagaag | ccatttggtc | tcaggagcaa | gatgggcaag | 300 |
| tggtgctgcc | gttgctttccc | ctgctgcagg | gagagcggca | agagcaacgt | gggcacttct | 360 |
| ggagaccacg | acgactctgc | tatgaagaca | ctcaggagca | agatgggcaa | gtggtgccgc | 420 |
| cactgcttcc | cctgctgcag | ggggagtggc | aagagcaacg | tgggcgcttc | tggagaccac | 480 |
| gacgaytctg | ctatgaagac | actcaggaac | aagatgggca | agtgggtgctg | ccactgcttc | 540 |
| ccctgctgca | gggggagcrg | caagagcaag | gtgggcgctt | ggggagacta | cgatgacagy | 600 |
| gccttcatgg | akcccaggta | ccacgtccrt | ggagaagatc | tggacaagct | ccacagagct | 660 |
| gcctgggtggg | gtaaaagtc | cagaaaggat | ctcatcgta | tgctcaggga | cackgaygtg | 720 |
| aacaagargg | acaagcaaaa | gaggactgct | ctacatctgg | cctctgccaa | tgggaattca | 780 |
| gaagtagtaa | aactcstgct | ggacagacga | tgtcaactta | atgtccttga | caacaaaaag | 840 |
| aggacagctc | tgayaaaggc | cgtacaatgc | caggaagatg | aatgtgcgtt | aatgttgctg | 900 |
| gaacatggca | ctgatccaaa | tattccagat | gagtatggaa | ataccactct | rcactaygct | 960 |
| rtctayaatg | aagataaatt | aatggccaaa | gcactgctct | tatayggtgc | tgatatcgaa | 1020 |
| tcaaaaaaca | agcatggcct | cacaccactg | ytacttggtt | tacatgagca | aaaacagcaa | 1080 |
| gtsgtgaaat | ttttaatyaa | gaaaaaagcg | aattttaa | gcrctggata | gatatggaag | 1140 |
| ractgctctc | atacttgctg | tatgttggtg | atcagcaagt | atagtcagcc | ytctacttga | 1200 |
| gcaaaatrtt | gatgtatctt | ctcaagatct | ggaaagacgg | ccagagagta | tgctgtttct | 1260 |

| | | | | | | |
|------------|------------|------------|-------------|------------|------------|------|
| agtcacatc | atgtaatttg | ccagttactt | tctgactaca | aagaaaaaca | gatgttaaaa | 1320 |
| atctcttctg | aaaacagcaa | tccagaacaa | gacttaaagc | tgacatcaga | ggaagagtca | 1380 |
| caaaggctta | aaggaagtga | aaacagccag | ccagaggcat | ggaaactttt | aaatttaaac | 1440 |
| tttttgctta | atgttttttt | tttttgctt | aataatatta | gatagtccca | aatgaaatwa | 1500 |
| cctatgagac | taggctttga | gaatcaatag | attctttttt | taagaatctt | ttggctagga | 1560 |
| gcggtgtctc | acgcctgtaa | ttccagcacc | ttgagaggct | gaggtgggca | gatcacgaga | 1620 |
| tcaggagatc | gagaccatcc | tggctaacac | ggtgaaaccc | catctctact | aaaaatacaa | 1680 |
| aaacttagct | gggtgtggtg | gcgggtgcct | gtagtccag | ctactcagga | rgctgaggca | 1740 |
| ggagaatggc | atgaacccgg | gaggtggagg | ttgcagttag | ccgagatccg | ccactacact | 1800 |
| ccagcctggg | tgacagagca | agactctgtc | tcaaaaaaaaa | aaaaaaaaaa | aaa | 1853 |

<210> 370

<211> 2184

<212> DNA

<213> Homo sapien

<400> 370

| | | | | | | |
|-------------|-------------|------------|-------------|-------------|-------------|------|
| ggcacgagaa | ttaaaaccct | cagcaaaaca | ggcatagaag | ggacatacct | ttaaagtaata | 60 |
| aaaaccacct | atgacaagcc | cacagccaac | ataatactaa | atggggaaaa | gttagaagca | 120 |
| tttctcttga | gaactgcaac | aataaataca | aggatgctgg | attttgtcaa | atgccttttc | 180 |
| tgtgtctgtt | gagatgctta | tgtgactttg | cttttaattc | tgtttatgtg | attatcacat | 240 |
| ttattgactt | gcctgtgtta | gaccggaaga | gctgggggtg | ttctcaggag | ccaccgtgtg | 300 |
| ctgcggcagc | ttcgggataa | cttgaggctg | catcactggg | gaagaaacac | aytctctgtc | 360 |
| gtggcgctga | tggctgagga | cagagcttca | gtgtggcttc | tctgugactg | gcttcttcgg | 420 |
| ggagttcttc | cttcatagtt | catccatagt | gctccagagg | aaaattatac | tattttgtta | 480 |
| tggatgaaga | gtattacgtt | gtgcagatat | actgcagtgt | cttcatctct | tgatgtgtga | 540 |
| ttgggtaggt | tccaccatgt | tgccgcagat | gacatgattt | cagtacctgt | gtctggctga | 600 |
| aaagtgtttg | tttgtgaatg | gatatttgtg | tttctggatc | tcactctctg | tgggtggaca | 660 |
| gctttctcca | ccttgctgga | agtgacctgc | tgtccagaag | tttgatggct | gaggagtata | 720 |
| ccatcgtgca | tgcacttttc | atttcctgca | tttcttcctc | cctggatgga | cagggggagc | 780 |
| ggcaagagca | acgtgggcac | ttctggagac | cacaacgact | cctctgtgaa | gacgcttggg | 840 |
| agcaagaggt | gcaagtgggtg | ctgccactgc | ttccctgct | gcagggggagc | ggcaagagca | 900 |
| acgtgggtcgc | ttggggagac | tacgatgaca | gcgccttcat | ggatcccagg | taccacgtcc | 960 |
| atggagaaga | tctggacaag | ctccacagag | ctgcctgggtg | gggtaaagtc | cccagaaagg | 1020 |
| atctcatcgt | catgctcagg | gacacggatg | tgaacaagag | ggacaagcaa | aagaggactg | 1080 |
| ctctacatct | ggcctctgcc | aatgggaatt | cagaagtagt | aaaactcgtg | ctggacagac | 1140 |
| gatgtcaact | taatgtcctt | gacaacaaaa | agaggacagc | tctgacaaag | gccgtacaat | 1200 |
| gccaggaaga | tgaatgtgcg | ttaatgttgc | tggaaacatg | cactgatcca | aatattccag | 1260 |
| atgagtatgg | aaataccact | ctacactatg | ctgtctacaa | tgaagataaa | ttaatggcca | 1320 |
| aagcactgct | cttatacggg | gctgatatcg | aatcaaaaaa | caagcatggc | ctcacaccac | 1380 |
| tgctacttgg | tatacatgag | caaaaacagc | aagtggtgaa | atttttaatc | aagaaaaaag | 1440 |
| cgaattttaa | tgcgctggat | agatatggaa | gaactgctct | catacttgct | gtatgttgtg | 1500 |
| gatcagcaag | tatagtcagc | cctctacttg | agcaaaatgt | tgatgtatct | tctcaagatc | 1560 |
| tggaaagacg | gccagagagt | atgctgtttc | tagtcatcat | catgtaattt | gccagtactt | 1620 |
| ttctgactac | aaagaaaaac | agatgttaaa | aatctcttct | gaaaacagca | atccagaaca | 1680 |
| agacttaaaag | ctgacatcag | aggaagagtc | acaaaggctt | aaaggaagtg | aaaacagcca | 1740 |
| gccagaggca | tggaaacttt | taaatttaaa | cttttgggtt | aatgtttttt | ttttttgcct | 1800 |
| taataatatt | agatagtccc | aaatgaaatw | acctatgaga | ctaggctttg | agaatcaata | 1860 |
| gattcttttt | ttaagaatct | tttggctagg | agcgggtgtct | cacgcctgta | attccagcac | 1920 |
| cttgagaggc | tgaggtgggc | agatcacgag | atcaggagat | cgagaccatc | ctggctaaca | 1980 |
| cgggtgaaacc | ccatctctac | taaaaataca | aaaacttagc | tgggtgtggt | ggcgggtgcc | 2040 |
| tgtagtccca | gctactcagg | argctgaggc | aggagaatgg | catgaacccg | ggaggtggag | 2100 |
| gttgagtgta | gccgagatcc | gccactacac | tccagcctgg | gtgacagagc | aagactctgt | 2160 |
| ctcaaaaaaa | aaaaaaaaaa | aaaa | | | | 2184 |

<210> 371
 <211> 1855
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(1855)
 <223> n = A,T,C or G

<400> 371

| | | | | | | |
|------------|-------------|------------|------------|-------------|-------------|------|
| tgcacgcac | ggccagtg | tgtgccacgt | acactgacgc | cccctgagat | gtgcacgccg | 60 |
| cacgcgcac | ttgcacgcgc | ggcagcggct | tggctggctt | gtaacggctt | gcacgcgcac | 120 |
| gccgccccg | cataaccgtc | agactggcct | gtaacggctt | gcaggcgcac | gccgcacgcg | 180 |
| cgtaacggct | tggctgccct | gtaacggctt | gcacgtgcat | gctgcacgcg | cgtaacggc | 240 |
| ttggctggca | tgtagccgct | tggcttggct | ttgcattt | tgctkggctk | ggcgttgkty | 300 |
| tcttggattg | acgcttcctc | cttggatkga | cgtttcctcc | ttggatkga | gtttcytyty | 360 |
| tcgcgttctt | ttgctggact | tgacctttty | tctgctgggt | ttggcattcc | tttgggggtg | 420 |
| gctgggtggt | ttctccgggg | gggktkgcc | ttcctgggg | gggcgtgggk | cgccccagg | 480 |
| gggcgtgggc | tttccccggg | tgggtgtggg | tttctctggg | gtgggggtggg | ctgtgctggg | 540 |
| atccccctgc | tgggggtggc | agggattgac | tttttcttc | aaacagattg | gaaacccgga | 600 |
| gtaacntgct | agttggtgaa | actgggtgg | agacgcgac | tgctgggtact | actgtttctc | 660 |
| ctggctgtta | aaagcagatg | gtggctgagg | ttgattcaat | gccggctgct | tcttctgtga | 720 |
| agaagccatt | tggctctcagg | agcaagatgg | gcaagtgggt | cgccactgct | tccccctgctg | 780 |
| cagggggagc | ggcaagagca | acgtgggcac | ttctggagac | cacaacgact | cctctgtgaa | 840 |
| gacgcttggg | agcaagaggt | gcaagtgggt | ctgcccactg | cttccccctgc | tgcaggggag | 900 |
| cggcaagagc | aacgtggkcg | cttggggaga | ctacgatgac | agcgccttca | tggakcccag | 960 |
| gtaccacgtc | crtggagaag | atctggacaa | gctccacaga | gctgcctgg | ggggtaaagt | 1020 |
| ccccagaaag | gatctcatcg | tcatgctcag | ggacactgay | gtgaacaaga | rggacaagca | 1080 |
| aaagaggact | gctctacatc | tggcctctgc | caatgggaat | tcagaagtag | taaaactcgt | 1140 |
| gctggacaga | cgatgtcaac | ttaatgtcct | tgacaacaaa | aagaggacag | ctctgacaaa | 1200 |
| ggccgtacaa | tgccaggaag | atgaatgtgc | gttaatgttg | ctggaacatg | gcactgatcc | 1260 |
| aaatatccca | gatgagtatg | gaaataccac | tctacactat | gctgtctaca | atgaagataa | 1320 |
| attaatggcc | aaagcactgc | tcttatacgg | tgctgatatc | gaatcaaaaa | acaaggataa | 1380 |
| gatctactaa | ttttatcttc | aaaatactga | aatgcattca | ttttaacatt | gacgtgtgta | 1440 |
| agggccagtc | ttccgtat | ggaagctcaa | gcataacttg | aatgaaaata | ttttgaaatg | 1500 |
| acctaattat | ctaagacttt | attttaata | ttgttat | caaagaagca | ttagagggtg | 1560 |
| cagttttttt | tttttaaatg | cacttctgg | aaatactttt | gttgaaaaca | ctgaatttgt | 1620 |
| aaaaggtaat | acttactatt | tttcaat | tccctcctag | gatttttttc | ccctaattgaa | 1680 |
| tgtaaagatg | caaaatttgc | cctgaaatag | gttttacatg | aaaactccaa | gaaaagttaa | 1740 |
| acatgtttca | gtgaatagag | atcctgctcc | tttggcaagt | tcctaaaaaa | cagtaataga | 1800 |
| tacgaggtga | tgcgctgtc | agtggcaagg | tttaagatat | ttctgatctc | gtgcc | 1855 |

<210> 372
 <211> 1059
 <212> DNA
 <213> Homo sapien

<400> 372

| | | | | | | |
|------------|------------|------------|------------|------------|------------|-----|
| gcaacgtggg | cacttctgga | gaccacaacg | actcctctgt | gaagacgctt | gggagcaaga | 60 |
| ggtgcaagtg | gtgctgcccc | ctgcttcccc | tgctgcaggg | gagcggcaag | agcaacgtgg | 120 |
| gcgcttgrgg | agactmcgat | gacagygcct | tcatggagcc | caggtaccac | gtccgtggag | 180 |
| aagatctgga | caagctccac | agagctgccc | tgggtgggta | aagtccccag | aaaggatctc | 240 |
| atcgtcatgc | tcagggacac | tgaygtgaac | aagarggaca | agcaaaagag | gactgctcta | 300 |
| catctggcct | ctgccaatgg | gaattcagaa | gtagtaaaac | tcctgctgga | cagacgatgt | 360 |

| | | | | | | |
|------------|------------|-------------|------------|-------------|------------|------|
| caacttaatg | tccttgacaa | caaaaagagg | acagctctga | yaaaggccgt | acaatgccag | 420 |
| gaagatgaat | gtgctgtaat | gttgctggaa | catggcactg | atccaaatat | tccagatgag | 480 |
| tatggaaata | ccactctrca | ctaygctrct | tayaatgaag | ataaattaat | ggccaaagca | 540 |
| ctgctcttat | ayggtgctga | tatcgaatca | aaaaacaagg | tatagatcta | ctaattttat | 600 |
| cttcaaaata | ctgaaatgca | ttcatTTTTaa | cattgacgtg | tgtaaagggcc | agtcctccgt | 660 |
| atttggaagc | tcaagcataa | cttgaatgaa | aatattttga | aatgacctaa | ttatctaaga | 720 |
| ctttatttta | aatattgtta | ttttcaaaga | agcattagag | ggtacagttt | ttttttttta | 780 |
| aatgcacttc | tggtaaatac | ttttgttgaa | aacactgaat | ttgtaaaagg | taatacttac | 840 |
| tatttttcaa | ttttccctc | ctaggatttt | tttcccttaa | tgaatgtaag | atggcaaaat | 900 |
| ttgccctgaa | ataggtttta | catgaaaact | ccaagaaaag | ttaaacatgt | ttcagtgaat | 960 |
| agagatcctg | ctcctttggc | aagttcctaa | aaaacagtaa | tagatacgag | gtgatgcgcc | 1020 |
| tgtcagtggc | aaggtttaag | atatttctga | tctcgtgcc | | | 1059 |

<210> 373

<211> 1155

<212> DNA

<213> Homo sapien

<400> 373

| | | | | | | |
|-------------|------------|------------|-------------|------------|-------------|------|
| atggtggttg | aggttgattc | catgccggct | gcctcttctg | tgaagaagcc | atttggtctc | 60 |
| aggagcaaga | tgggcaagtg | gtgctgccgt | tgcttcccc | gctgcaggga | gagcggcaag | 120 |
| agcaacgtgg | gcacttctgg | agaccacgac | gactctgcta | tgaagacact | caggagcaag | 180 |
| atgggcaagt | ggtgccgcca | ctgcttcccc | tgctgcaggg | ggagtggcaa | gagcaacgtg | 240 |
| ggcgcttctg | gagaccacga | cgactctgct | atgaagacac | tcaggaacaa | gatgggcaag | 300 |
| tgggtgctgcc | actgcttccc | ctgctgcagg | gggagcggca | agagcaaggt | gggcgcttgg | 360 |
| ggagactacg | atgacagtgc | cttcatggag | cccaggtagc | acgtccgtgg | agaagatctg | 420 |
| gacaagctcc | acagagctgc | ctggtggggg | aaagtcccca | gaaaggatct | catcgctcatg | 480 |
| ctcagggaca | ctgacgtgaa | caagaaggac | aagcaaaaaga | ggactgctct | acatctggcc | 540 |
| tctgccaatg | ggaattcaga | agtagtaaaa | ctcctgctgg | acagacgatg | tcaacttaat | 600 |
| gtccttgaca | acaaaaagag | gacagctctg | ataaaggccg | tacaatgcca | ggaagatgaa | 660 |
| tgtgcgttaa | tggtgctgga | acatggcact | gatccaaata | ttccagatga | gtatggaaat | 720 |
| accactctgc | actacgctat | ctataatgaa | gataaattaa | tggccaaagc | actgctctta | 780 |
| tatggtgctg | atatcgaatc | aaaaaacaag | catggcctca | caccactgtt | acttgggtga | 840 |
| catgagcaaa | aacagcaagt | cgtgaaattt | ttaatcaaga | aaaaagcgaa | tttaaatgca | 900 |
| ctggatagat | atggaaggac | tgctctcata | cttgcgtgat | gttgtggatc | agcaagtata | 960 |
| gtcagccttc | tacttgagca | aaatattgat | gtatcttctc | aagatctatc | tggacagacg | 1020 |
| gccagagagt | atgctgtttc | tagtcatcat | catgtaattt | gccagttact | ttctgactac | 1080 |
| aaagaaaaac | agatgctaaa | aatctcttct | gaaaacagca | atccagaaaa | tgtctcaaga | 1140 |
| accagaaata | aataa | | | | | 1155 |

<210> 374

<211> 2000

<212> DNA

<213> Homo sapien

<400> 374

| | | | | | | |
|-------------|------------|------------|--------------|------------|-------------|-----|
| atggtggttg | aggttgattc | catgccggct | gcctcttctg | tgaagaagcc | atttggtctc | 60 |
| aggagcaaga | tgggcaagtg | gtgctgccgt | tgcttcccc | gctgcaggga | gagcggcaag | 120 |
| agcaacgtgg | gcacttctgg | agaccacgac | gactctgcta | tgaagacact | caggagcaag | 180 |
| atgggcaagt | ggtgccgcca | ctgcttcccc | tgctgcaggg | ggagtggcaa | gagcaacgtg | 240 |
| ggcgcttctg | gagaccacga | cgactctgct | atgaagacac | tcaggaacaa | gatgggcaag | 300 |
| tgggtgctgcc | actgcttccc | ctgctgcagg | gggagcggca | agagcaaggt | gggcgcttgg | 360 |
| ggagactacg | atgacagtgc | cttcatggag | cccaggtagc | acgtccgtgg | agaagatctg | 420 |
| gacaagctcc | acagagctgc | ctggtggggg | aaagtcccca | gaaaggatct | catcgctcatg | 480 |
| ctcagggaca | ctgacgtgaa | caagaaggac | aaagcaaaaaga | ggactgctct | acatctggcc | 540 |

| | | | | | | |
|------------|------------|-------------|-------------|-------------|-------------|------|
| tctgccaatg | ggaattcaga | agtagtaaaa | ctcctgctgg | acagacgatg | tcaacttaat | 600 |
| gtccttgaca | acaaaaagag | gacagctctg | ataaaggccg | tacaatgcca | ggaagatgaa | 660 |
| tgtgcgtaa | tgttgctgga | acatggcact | gatccaaata | ttccagatga | gtatggaaat | 720 |
| accactctgc | actacgctat | ctataatgaa | gataaattaa | tggccaaagc | actgctctta | 780 |
| tatggtgctg | atatcgaatc | aaaaaacaag | catggcctca | caccactgtt | acttggtgta | 840 |
| catgagcaaa | aacagcaagt | cgtgaaattt | ttaatcaaga | aaaaagcgaa | tttaaatgca | 900 |
| ctggatagat | atggaaggac | tgctctcata | cttgctgtat | gttggtggatc | agcaagtata | 960 |
| gtcagccttc | tacttgagca | aaatattgat | gtatcttctc | aagatctatc | tggacagacg | 1020 |
| gccagagagt | atgctgtttc | tagtcacatc | catgtaattt | gccagttact | ttctgactac | 1080 |
| aaagaaaaac | agatgctaaa | aatctcttct | gaaaacagca | atccagaaca | agacttaaag | 1140 |
| ctgacatcag | aggaagagtc | acaaagggttc | aaaggcagtg | aaaatagcca | gccagagaaa | 1200 |
| atgtctcaag | aaccagaaat | aaataaggat | ggtgatagag | aggttgaaga | agaaatgaag | 1260 |
| aagcatgaaa | gtaataatgt | gggattacta | gaaaacctga | ctaattggtgt | cactgctggc | 1320 |
| aatggtgata | atggattaat | tcctcaaagg | aagagcagaa | cacctgaaaa | tcagcaattt | 1380 |
| cctgacaacg | aaagtgaaga | gtatcacaga | atttgcgaa | tagtttctga | ctacaaagaa | 1440 |
| aaacagatgc | caaaatactc | ttctgaaaac | agcaaccacg | aacaagactt | aaagctgaca | 1500 |
| tcagaggaag | agtcacaaag | gcttgagggc | agtgaanaatg | gccagccaga | gctagaaaaat | 1560 |
| tttatggcta | tcgaagaaat | gaagaagcac | ggaagtactc | atgtcggatt | cccagaaaaac | 1620 |
| ctgactaatg | gtgccactgc | tggcaatggt | gatgatggat | taattcctcc | aaggaagagc | 1680 |
| agaacacctg | aaagccagca | atttcctgac | actgagaatg | aagagtatca | cagtgcagaa | 1740 |
| caaaatgata | ctcagaagca | atcttgatga | gaacagaaca | ctggaatatt | acacgatgag | 1800 |
| attctgattc | atgaagaaaa | gcagatagaa | gtggttgaaa | aaatgaattc | tgagctttct | 1860 |
| cttagttgta | agaaagaaaa | agacatcttg | catgaaaata | gtacgttgcg | ggaagaaatt | 1920 |
| gccatgctaa | gactggagct | agacacaatg | aaacatcaga | gccagctaaa | aaaaaaaaaa | 1980 |
| aaaaaaaaaa | aaaaaaaaaa | | | | | 2000 |

<210> 375

<211> 2040

<212> DNA

<213> Homo sapien

<400> 375

| | | | | | | |
|------------|------------|-------------|-------------|-------------|------------|------|
| atggtgggtg | agggtgatcc | catgccggct | gcctcttctg | tgaagaagcc | atttggtctc | 60 |
| aggagcaaga | tgggcaagtg | gtgctgccgt | tgcttcccct | gctgcaggga | gagcggcaag | 120 |
| agcaacgtgg | gcacttctgg | agaccacgac | gactctgcta | tgaagacact | caggagcaag | 180 |
| atgggcaagt | ggtgcccga | ctgcttcccc | tgctgcaggg | ggagtggcaa | gagcaacgtg | 240 |
| ggcgcttctg | gagaccacga | cgactctgct | atgaagacac | tcaggaacaa | gatgggcaag | 300 |
| tggtgctgcc | actgcttccc | ctgctgcagg | gggagcggca | agagcaaggt | gggcgcttgg | 360 |
| ggagactacg | atgacagtgc | cttcatggag | cccaggtacc | acgtccgtgg | agaagatctg | 420 |
| gacaagctcc | acagagctgc | ctggtggggg | aaagtcccca | gaaaggatct | catcgtcatg | 480 |
| ctcagggaca | ctgacgtgaa | caagaaggac | aagcaaaaaga | ggactgctct | acatctggcc | 540 |
| tctgccaatg | ggaattcaga | agtagtaaaa | ctcctgctgg | acagacgatg | tcaacttaat | 600 |
| gtccttgaca | acaaaaagag | gacagctctg | ataaaggccg | tacaatgcca | ggaagatgaa | 660 |
| tgtgcgtaa | tgttgctgga | acatggcact | gatccaaata | ttccagatga | gtatggaaat | 720 |
| accactctgc | actacgctat | ctataatgaa | gataaattaa | tggccaaagc | actgctctta | 780 |
| tatggtgctg | atatcgaatc | aaaaaacaag | catggcctca | caccactgtt | acttggtgta | 840 |
| catgagcaaa | aacagcaagt | cgtgaaattt | ttaatcaaga | aaaaagcgaa | tttaaatgca | 900 |
| ctggatagat | atggaaggac | tgctctcata | cttgctgtat | gttggtggatc | agcaagtata | 960 |
| gtcagccttc | tacttgagca | aaatattgat | gtatcttctc | aagatctatc | tggacagacg | 1020 |
| gccagagagt | atgctgtttc | tagtcacatc | catgtaattt | gccagttact | ttctgactac | 1080 |
| aaagaaaaac | agatgctaaa | aatctcttct | gaaaacagca | atccagaaca | agacttaaag | 1140 |
| ctgacatcag | aggaagagtc | acaaagggttc | aaaggcagtg | aaaatagcca | gccagagaaa | 1200 |
| atgtctcaag | aaccagaaat | aaataaggat | ggtgatagag | aggttgaaga | agaaatgaag | 1260 |
| aagcatgaaa | gtaataatgt | gggattacta | gaaaacctga | ctaattggtgt | cactgctggc | 1320 |
| aatggtgata | atggattaat | tcctcaaagg | aagagcagaa | cacctgaaaa | tcagcaattt | 1380 |

```

cctgacaacg aaagtgaaga gtatcacaga atttgcaaat tagtttctga ctacaaagaa 1440
aaacagatgc caaaatactc ttctgaaaac agcaaccag aacaagactt aaagctgaca 1500
tcagaggaag agtcacaaaag gcttgagggc agtgaaaatg gccagccaga gaaaagatct 1560
caagaaccag aaataaataa ggatgggtgat agagagctag aaaattttat ggctatcgaa 1620
gaaatgaaga agcacggaag tactcatgtc ggattcccag aaaacctgac taatgggtgcc 1680
actgctggca atgggtgatga tggattaatt cctccaagga agagcagaac acctgaaagc 1740
cagcaatttc ctgacactga gaatgaagag taccacagt acgaacaaaa tgatactcag 1800
aagcaatttt gtgaagaaca gaacactgga atattacacg atgagattct gattcatgaa 1860
gaaaagcaga tagaagtggg tgaaaaaatg aattctgagc tttctcttag ttgtaagaaa 1920
gaaaaagaca tcttgcacga aaatagtagc ttgcgggaag aaattgccat gctaagactg 1980
gagctagaca caatgaaaca tcagagccag ctaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 2040

```

```

<210> 376
<211> 329
<212> PRT
<213> Homo sapien

```

```

<400> 376
Met Asp Ile Val Val Ser Gly Ser His Pro Leu Trp Val Asp Ser Phe
 1             5             10             15
Leu His Leu Ala Gly Ser Asp Leu Leu Ser Arg Ser Leu Met Ala Glu
      20             25             30
Glu Tyr Thr Ile Val His Ala Ser Phe Ile Ser Cys Ile Ser Ser Ser
      35             40             45
Leu Asp Gly Gln Gly Glu Arg Gln Glu Gln Arg Gly His Phe Trp Arg
      50             55             60
Pro Gln Arg Leu Leu Cys Glu Asp Ala Trp Glu Gln Glu Val Gln Val
      65             70             75             80
Val Leu Pro Leu Leu Pro Leu Leu Gln Gly Ser Gly Lys Ser Asn Val
      85             90             95
Val Ala Trp Gly Asp Tyr Asp Asp Ser Ala Phe Met Asp Pro Arg Tyr
      100            105            110
His Val His Gly Glu Asp Leu Asp Lys Leu His Arg Ala Ala Trp Trp
      115            120            125
Gly Lys Val Pro Arg Lys Asp Leu Ile Val Met Leu Arg Asp Thr Asp
      130            135            140
Val Asn Lys Arg Asp Lys Gln Lys Arg Thr Ala Leu His Leu Ala Ser
      145            150            155            160
Ala Asn Gly Asn Ser Glu Val Val Lys Leu Val Leu Asp Arg Arg Cys
      165            170            175
Gln Leu Asn Val Leu Asp Asn Lys Lys Arg Thr Ala Leu Thr Lys Ala
      180            185            190
Val Gln Cys Gln Glu Asp Glu Cys Ala Leu Met Leu Leu Glu His Gly
      195            200            205
Thr Asp Pro Asn Ile Pro Asp Glu Tyr Gly Asn Thr Thr Leu His Tyr
      210            215            220
Ala Val Tyr Asn Glu Asp Lys Leu Met Ala Lys Ala Leu Leu Leu Tyr
      225            230            235            240
Gly Ala Asp Ile Glu Ser Lys Asn Lys His Gly Leu Thr Pro Leu Leu
      245            250            255
Leu Gly Ile His Glu Gln Lys Gln Gln Val Val Lys Phe Leu Ile Lys
      260            265            270
Lys Lys Ala Asn Leu Asn Ala Leu Asp Arg Tyr Gly Arg Thr Ala Leu
      275            280            285
Ile Leu Ala Val Cys Cys Gly Ser Ala Ser Ile Val Ser Pro Leu Leu

```

290 295 300
 Glu Gln Asn Val Asp Val Ser Ser Gln Asp Leu Glu Arg Arg Pro Glu
 305 310 315 320
 Ser Met Leu Phe Leu Val Ile Ile Met
 325

<210> 377

<211> 148

<212> PRT

<213> Homo sapien

<220>

<221> VARIANT

<222> (1)...(148)

<223> Xaa = Any Amino Acid

<400> 377

Met Thr Xaa Pro Ser Trp Ser Pro Gly Thr Thr Ser Val Glu Lys Ile
 1 5 10 15
 Trp Thr Ser Ser Thr Glu Leu Pro Trp Trp Gly Lys Val Pro Arg Lys
 20 25 30
 Asp Leu Ile Val Met Leu Arg Asp Thr Asp Val Asn Lys Xaa Asp Lys
 35 40 45
 Gln Lys Arg Thr Ala Leu His Leu Ala Ser Ala Asn Gly Asn Ser Glu
 50 55 60
 Val Val Lys Leu Xaa Leu Asp Arg Arg Cys Gln Leu Asn Val Leu Asp
 65 70 75 80
 Asn Lys Lys Arg Thr Ala Leu Xaa Lys Ala Val Gln Cys Gln Glu Asp
 85 90 95
 Glu Cys Ala Leu Met Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro
 100 105 110
 Asp Glu Tyr Gly Asn Thr Thr Leu His Tyr Ala Xaa Tyr Asn Glu Asp
 115 120 125
 Lys Leu Met Ala Lys Ala Leu Leu Tyr Gly Ala Asp Ile Glu Ser
 130 135 140
 Lys Asn Lys Val
 145

<210> 378

<211> 1719

<212> PRT

<213> Homo sapien

<400> 378

Met Val Val Glu Val Asp Ser Met Pro Ala Ala Ser Ser Val Lys Lys
 1 5 10 15
 Pro Phe Gly Leu Arg Ser Lys Met Gly Lys Trp Cys Cys Arg Cys Phe
 20 25 30
 Pro Cys Cys Arg Glu Ser Gly Lys Ser Asn Val Gly Thr Ser Gly Asp
 35 40 45
 His Asp Asp Ser Ala Met Lys Thr Leu Arg Ser Lys Met Gly Lys Trp
 50 55 60
 Cys Arg His Cys Phe Pro Cys Cys Arg Gly Ser Gly Lys Ser Asn Val
 65 70 75 80
 Gly Ala Ser Gly Asp His Asp Asp Ser Ala Met Lys Thr Leu Arg Asn

[illegible]

Asp Lys Leu His Arg Ala Ala Trp Trp Gly Lys Val Pro Arg Lys Asp
 530 535 540
 Leu Ile Val Met Leu Arg Asp Thr Asp Val Asn Lys Lys Asp Lys Gln
 545 550 555 560
 Lys Arg Thr Ala Leu His Leu Ala Ser Ala Asn Gly Asn Ser Glu Val
 565 570 575
 Val Lys Leu Leu Leu Asp Arg Arg Cys Gln Leu Asn Val Leu Asp Asn
 580 585 590
 Lys Lys Arg Thr Ala Leu Ile Lys Ala Val Gln Cys Gln Glu Asp Glu
 595 600 605
 Cys Ala Leu Met Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro Asp
 610 615 620
 Glu Tyr Gly Asn Thr Thr Leu His Tyr Ala Ile Tyr Asn Glu Asp Lys
 625 630 635 640
 Leu Met Ala Lys Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu Ser Lys
 645 650 655
 Asn Lys His Gly Leu Thr Pro Leu Leu Leu Gly Val His Glu Gln Lys
 660 665 670
 Gln Gln Val Val Lys Phe Leu Ile Lys Lys Lys Ala Asn Leu Asn Ala
 675 680 685
 Leu Asp Arg Tyr Gly Arg Thr Ala Leu Ile Leu Ala Val Cys Cys Gly
 690 695 700
 Ser Ala Ser Ile Val Ser Leu Leu Leu Glu Gln Asn Ile Asp Val Ser
 705 710 715 720
 Ser Gln Asp Leu Ser Gly Gln Thr Ala Arg Glu Tyr Ala Val Ser Ser
 725 730 735
 His His His Val Ile Cys Gln Leu Leu Ser Asp Tyr Lys Glu Lys Gln
 740 745 750
 Met Leu Lys Ile Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp Leu Lys
 755 760 765
 Leu Thr Ser Glu Glu Glu Ser Gln Arg Phe Lys Gly Ser Glu Asn Ser
 770 775 780
 Gln Pro Glu Lys Met Ser Gln Glu Pro Glu Ile Asn Lys Asp Gly Asp
 785 790 795 800
 Arg Glu Val Glu Glu Glu Met Lys Lys His Glu Ser Asn Asn Val Gly
 805 810 815
 Leu Leu Glu Asn Leu Thr Asn Gly Val Thr Ala Gly Asn Gly Asp Asn
 820 825 830
 Gly Leu Ile Pro Gln Arg Lys Ser Arg Thr Pro Glu Asn Gln Gln Phe
 835 840 845
 Pro Asp Asn Glu Ser Glu Glu Tyr His Arg Ile Cys Glu Leu Val Ser
 850 855 860
 Asp Tyr Lys Glu Lys Gln Met Pro Lys Tyr Ser Ser Glu Asn Ser Asn
 865 870 875 880
 Pro Glu Gln Asp Leu Lys Leu Thr Ser Glu Glu Glu Ser Gln Arg Leu
 885 890 895
 Glu Gly Ser Glu Asn Gly Gln Pro Glu Leu Glu Asn Phe Met Ala Ile
 900 905 910
 Glu Glu Met Lys Lys His Gly Ser Thr His Val Gly Phe Pro Glu Asn
 915 920 925
 Leu Thr Asn Gly Ala Thr Ala Gly Asn Gly Asp Asp Gly Leu Ile Pro
 930 935 940
 Pro Arg Lys Ser Arg Thr Pro Glu Ser Gln Gln Phe Pro Asp Thr Glu
 945 950 955 960
 Asn Glu Glu Tyr His Ser Asp Glu Gln Asn Asp Thr Gln Lys Gln Phe

| | | | | | |
|-------------|---|--|------|--|------|
| | 965 | | 970 | | 975 |
| Cys Glu Glu | Gln Asn Thr Gly Ile Leu His Asp Glu Ile Leu Ile His | | | | |
| | 980 | | 985 | | 990 |
| Glu Glu Lys | Gln Ile Glu Val Val Glu Lys Met Asn Ser Glu Leu Ser | | | | |
| | 995 | | 1000 | | 1005 |
| Leu Ser Cys | Lys Lys Glu Lys Asp Ile Leu His Glu Asn Ser Thr Leu | | | | |
| | 1010 | | 1015 | | 1020 |
| Arg Glu Glu | Ile Ala Met Leu Arg Leu Glu Leu Asp Thr Met Lys His | | | | |
| | 1025 | | 1030 | | 1035 |
| Gln Ser Gln | Leu Pro Arg Thr His Met Val Val Glu Val Asp Ser Met | | | | |
| | 1045 | | 1050 | | 1055 |
| Pro Ala Ala | Ser Ser Val Lys Lys Pro Phe Gly Leu Arg Ser Lys Met | | | | |
| | 1060 | | 1065 | | 1070 |
| Gly Lys Trp | Cys Cys Arg Cys Phe Pro Cys Cys Arg Glu Ser Gly Lys | | | | |
| | 1075 | | 1080 | | 1085 |
| Ser Asn Val | Gly Thr Ser Gly Asp His Asp Asp Ser Ala Met Lys Thr | | | | |
| | 1090 | | 1095 | | 1100 |
| Leu Arg Ser | Lys Met Gly Lys Trp Cys Arg His Cys Phe Pro Cys Cys | | | | |
| | 1105 | | 1110 | | 1115 |
| Arg Gly Ser | Gly Lys Ser Asn Val Gly Ala Ser Gly Asp His Asp Asp | | | | |
| | 1125 | | 1130 | | 1135 |
| Ser Ala Met | Lys Thr Leu Arg Asn Lys Met Gly Lys Trp Cys Cys His | | | | |
| | 1140 | | 1145 | | 1150 |
| Cys Phe Pro | Cys Cys Arg Gly Ser Gly Lys Ser Lys Val Gly Ala Trp | | | | |
| | 1155 | | 1160 | | 1165 |
| Gly Asp Tyr | Asp Asp Ser Ala Phe Met Glu Pro Arg Tyr His Val Arg | | | | |
| | 1170 | | 1175 | | 1180 |
| Gly Glu Asp | Leu Asp Lys Leu His Arg Ala Ala Trp Trp Gly Lys Val | | | | |
| | 1185 | | 1190 | | 1195 |
| Pro Arg Lys | Asp Leu Ile Val Met Leu Arg Asp Thr Asp Val Asn Lys | | | | |
| | 1205 | | 1210 | | 1215 |
| Lys Asp Lys | Gln Lys Arg Thr Ala Leu His Leu Ala Ser Ala Asn Gly | | | | |
| | 1220 | | 1225 | | 1230 |
| Asn Ser Glu | Val Val Lys Leu Leu Leu Asp Arg Arg Cys Gln Leu Asn | | | | |
| | 1235 | | 1240 | | 1245 |
| Val Leu Asp | Asn Lys Lys Arg Thr Ala Leu Ile Lys Ala Val Gln Cys | | | | |
| | 1250 | | 1255 | | 1260 |
| Gln Glu Asp | Glu Cys Ala Leu Met Leu Leu Glu His Gly Thr Asp Pro | | | | |
| | 1265 | | 1270 | | 1275 |
| Asn Ile Pro | Asp Glu Tyr Gly Asn Thr Thr Leu His Tyr Ala Ile Tyr | | | | |
| | 1285 | | 1290 | | 1295 |
| Asn Glu Asp | Lys Leu Met Ala Lys Ala Leu Leu Leu Tyr Gly Ala Asp | | | | |
| | 1300 | | 1305 | | 1310 |
| Ile Glu Ser | Lys Asn Lys His Gly Leu Thr Pro Leu Leu Leu Gly Val | | | | |
| | 1315 | | 1320 | | 1325 |
| His Glu Gln | Lys Gln Gln Val Val Lys Phe Leu Ile Lys Lys Lys Ala | | | | |
| | 1330 | | 1335 | | 1340 |
| Asn Leu Asn | Ala Leu Asp Arg Tyr Gly Arg Thr Ala Leu Ile Leu Ala | | | | |
| | 1345 | | 1350 | | 1355 |
| Val Cys Cys | Gly Ser Ala Ser Ile Val Ser Leu Leu Leu Glu Gln Asn | | | | |
| | 1365 | | 1370 | | 1375 |
| Ile Asp Val | Ser Ser Gln Asp Leu Ser Gly Gln Thr Ala Arg Glu Tyr | | | | |
| | 1380 | | 1385 | | 1390 |
| Ala Val Ser | Ser His His His Val Ile Cys Gln Leu Leu Ser Asp Tyr | | | | |
| | 1395 | | 1400 | | 1405 |

Lys Glu Lys Gln Met Leu Lys Ile Ser Ser Glu Asn Ser Asn Pro Glu
 1410 1415 1420
 Gln Asp Leu Lys Leu Thr Ser Glu Glu Glu Ser Gln Arg Phe Lys Gly
 1425 1430 1435 144
 Ser Glu Asn Ser Gln Pro Glu Lys Met Ser Gln Glu Pro Glu Ile Asn
 1445 1450 1455
 Lys Asp Gly Asp Arg Glu Val Glu Glu Glu Met Lys Lys His Glu Ser
 1460 1465 1470
 Asn Asn Val Gly Leu Leu Glu Asn Leu Thr Asn Gly Val Thr Ala Gly
 1475 1480 1485
 Asn Gly Asp Asn Gly Leu Ile Pro Gln Arg Lys Ser Arg Thr Pro Glu
 1490 1495 1500
 Asn Gln Gln Phe Pro Asp Asn Glu Ser Glu Glu Tyr His Arg Ile Cys
 1505 1510 1515 152
 Glu Leu Val Ser Asp Tyr Lys Glu Lys Gln Met Pro Lys Tyr Ser Ser
 1525 1530 1535
 Glu Asn Ser Asn Pro Glu Gln Asp Leu Lys Leu Thr Ser Glu Glu Glu
 1540 1545 1550
 Ser Gln Arg Leu Glu Gly Ser Glu Asn Gly Gln Pro Glu Lys Arg Ser
 1555 1560 1565
 Gln Glu Pro Glu Ile Asn Lys Asp Gly Asp Arg Glu Leu Glu Asn Phe
 1570 1575 1580
 Met Ala Ile Glu Glu Met Lys Lys His Gly Ser Thr His Val Gly Phe
 1585 1590 1595 160
 Pro Glu Asn Leu Thr Asn Gly Ala Thr Ala Gly Asn Gly Asp Asp Gly
 1605 1610 1615
 Leu Ile Pro Pro Arg Lys Ser Arg Thr Pro Glu Ser Gln Gln Phe Pro
 1620 1625 1630
 Asp Thr Glu Asn Glu Glu Tyr His Ser Asp Glu Gln Asn Asp Thr Gln
 1635 1640 1645
 Lys Gln Phe Cys Glu Glu Gln Asn Thr Gly Ile Leu His Asp Glu Ile
 1650 1655 1660
 Leu Ile His Glu Glu Lys Gln Ile Glu Val Val Glu Lys Met Asn Ser
 1665 1670 1675 168
 Glu Leu Ser Leu Ser Cys Lys Lys Glu Lys Asp Ile Leu His Glu Asn
 1685 1690 1695
 Ser Thr Leu Arg Glu Glu Ile Ala Met Leu Arg Leu Glu Leu Asp Thr
 1700 1705 1710
 Met Lys His Gln Ser Gln Leu
 1715

<210> 379

<211> 656

<212> PRT

<213> Homo sapien

<400> 379

Met Val Val Glu Val Asp Ser Met Pro Ala Ala Ser Ser Val Lys Lys
 1 5 10 15
 Pro Phe Gly Leu Arg Ser Lys Met Gly Lys Trp Cys Cys Arg Cys Phe
 20 25 30
 Pro Cys Cys Arg Glu Ser Gly Lys Ser Asn Val Gly Thr Ser Gly Asp
 35 40 45
 His Asp Asp Ser Ala Met Lys Thr Leu Arg Ser Lys Met Gly Lys Trp
 50 55 60

Cys Arg His Cys Phe Pro Cys Cys Arg Gly Ser Gly Lys Ser Asn Val
 65 70 75 80
 Gly Ala Ser Gly Asp His Asp Asp Ser Ala Met Lys Thr Leu Arg Asn
 85 90 95
 Lys Met Gly Lys Trp Cys Cys His Cys Phe Pro Cys Cys Arg Gly Ser
 100 105 110
 Gly Lys Ser Lys Val Gly Ala Trp Gly Asp Tyr Asp Asp Ser Ala Phe
 115 120 125
 Met Glu Pro Arg Tyr His Val Arg Gly Glu Asp Leu Asp Lys Leu His
 130 135 140
 Arg Ala Ala Trp Trp Gly Lys Val Pro Arg Lys Asp Leu Ile Val Met
 145 150 155 160
 Leu Arg Asp Thr Asp Val Asn Lys Lys Asp Lys Gln Lys Arg Thr Ala
 165 170 175
 Leu His Leu Ala Ser Ala Asn Gly Asn Ser Glu Val Val Lys Leu Leu
 180 185 190
 Leu Asp Arg Arg Cys Gln Leu Asn Val Leu Asp Asn Lys Lys Arg Thr
 195 200 205
 Ala Leu Ile Lys Ala Val Gln Cys Gln Glu Asp Glu Cys Ala Leu Met
 210 215 220
 Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro Asp Glu Tyr Gly Asn
 225 230 235 240
 Thr Thr Leu His Tyr Ala Ile Tyr Asn Glu Asp Lys Leu Met Ala Lys
 245 250 255
 Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu Ser Lys Asn Lys His Gly
 260 265 270
 Leu Thr Pro Leu Leu Leu Gly Val His Glu Gln Lys Gln Gln Val Val
 275 280 285
 Lys Phe Leu Ile Lys Lys Lys Ala Asn Leu Asn Ala Leu Asp Arg Tyr
 290 295 300
 Gly Arg Thr Ala Leu Ile Leu Ala Val Cys Cys Gly Ser Ala Ser Ile
 305 310 315 320
 Val Ser Leu Leu Leu Glu Gln Asn Ile Asp Val Ser Ser Gln Asp Leu
 325 330 335
 Ser Gly Gln Thr Ala Arg Glu Tyr Ala Val Ser Ser His His Val
 340 345 350
 Ile Cys Gln Leu Leu Ser Asp Tyr Lys Glu Lys Gln Met Leu Lys Ile
 355 360 365
 Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp Leu Lys Leu Thr Ser Glu
 370 375 380
 Glu Glu Ser Gln Arg Phe Lys Gly Ser Glu Asn Ser Gln Pro Glu Lys
 385 390 395 400
 Met Ser Gln Glu Pro Glu Ile Asn Lys Asp Gly Asp Arg Glu Val Glu
 405 410 415
 Glu Glu Met Lys Lys His Glu Ser Asn Asn Val Gly Leu Leu Glu Asn
 420 425 430
 Leu Thr Asn Gly Val Thr Ala Gly Asn Gly Asp Asn Gly Leu Ile Pro
 435 440 445
 Gln Arg Lys Ser Arg Thr Pro Glu Asn Gln Gln Phe Pro Asp Asn Glu
 450 455 460
 Ser Glu Glu Tyr His Arg Ile Cys Glu Leu Val Ser Asp Tyr Lys Glu
 465 470 475 480
 Lys Gln Met Pro Lys Tyr Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp
 485 490 495
 Leu Lys Leu Thr Ser Glu Glu Glu Ser Gln Arg Leu Glu Gly Ser Glu

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      500      505      510
Asn Gly Gln Pro Glu Leu Glu Asn Phe Met Ala Ile Glu Glu Met Lys
      515      520      525
Lys His Gly Ser Thr His Val Gly Phe Pro Glu Asn Leu Thr Asn Gly
      530      535      540
Ala Thr Ala Gly Asn Gly Asp Asp Gly Leu Ile Pro Pro Arg Lys Ser
545      550      555      560
Arg Thr Pro Glu Ser Gln Gln Phe Pro Asp Thr Glu Asn Glu Glu Tyr
      565      570      575
His Ser Asp Glu Gln Asn Asp Thr Gln Lys Gln Phe Cys Glu Glu Gln
      580      585      590
Asn Thr Gly Ile Leu His Asp Glu Ile Leu Ile His Glu Glu Lys Gln
      595      600      605
Ile Glu Val Val Glu Lys Met Asn Ser Glu Leu Ser Leu Ser Cys Lys
      610      615      620
Lys Glu Lys Asp Ile Leu His Glu Asn Ser Thr Leu Arg Glu Glu Ile
625      630      635      640
Ala Met Leu Arg Leu Glu Leu Asp Thr Met Lys His Gln Ser Gln Leu
      645      650      655

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<210> 380
<211> 671
<212> PRT
<213> Homo sapien

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      <400> 380
Met Val Val Glu Val Asp Ser Met Pro Ala Ala Ser Ser Val Lys Lys
 1      5      10      15
Pro Phe Gly Leu Arg Ser Lys Met Gly Lys Trp Cys Cys Arg Cys Phe
      20      25      30
Pro Cys Cys Arg Glu Ser Gly Lys Ser Asn Val Gly Thr Ser Gly Asp
      35      40      45
His Asp Asp Ser Ala Met Lys Thr Leu Arg Ser Lys Met Gly Lys Trp
      50      55      60
Cys Arg His Cys Phe Pro Cys Cys Arg Gly Ser Gly Lys Ser Asn Val
65      70      75      80
Gly Ala Ser Gly Asp His Asp Asp Ser Ala Met Lys Thr Leu Arg Asn
      85      90      95
Lys Met Gly Lys Trp Cys Cys His Cys Phe Pro Cys Cys Arg Gly Ser
      100      105      110
Gly Lys Ser Lys Val Gly Ala Trp Gly Asp Tyr Asp Asp Ser Ala Phe
      115      120      125
Met Glu Pro Arg Tyr His Val Arg Gly Glu Asp Leu Asp Lys Leu His
      130      135      140
Arg Ala Ala Trp Trp Gly Lys Val Pro Arg Lys Asp Leu Ile Val Met
145      150      155      160
Leu Arg Asp Thr Asp Val Asn Lys Lys Asp Lys Gln Lys Arg Thr Ala
      165      170      175
Leu His Leu Ala Ser Ala Asn Gly Asn Ser Glu Val Val Lys Leu Leu
      180      185      190
Leu Asp Arg Arg Cys Gln Leu Asn Val Leu Asp Asn Lys Lys Arg Thr
      195      200      205
Ala Leu Ile Lys Ala Val Gln Cys Gln Glu Asp Glu Cys Ala Leu Met
      210      215      220
Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro Asp Glu Tyr Gly Asn

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225 230 235 240
 Thr Thr Leu His Tyr Ala Ile Tyr Asn Glu Asp Lys Leu Met Ala Lys
 245 250 255
 Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu Ser Lys Asn Lys His Gly
 260 265 270
 Leu Thr Pro Leu Leu Leu Gly Val His Glu Gln Lys Gln Gln Val Val
 275 280 285
 Lys Phe Leu Ile Lys Lys Lys Ala Asn Leu Asn Ala Leu Asp Arg Tyr
 290 295 300
 Gly Arg Thr Ala Leu Ile Leu Ala Val Cys Cys Gly Ser Ala Ser Ile
 305 310 315 320
 Val Ser Leu Leu Leu Glu Gln Asn Ile Asp Val Ser Ser Gln Asp Leu
 325 330 335
 Ser Gly Gln Thr Ala Arg Glu Tyr Ala Val Ser Ser His His His Val
 340 345 350
 Ile Cys Gln Leu Leu Ser Asp Tyr Lys Glu Lys Gln Met Leu Lys Ile
 355 360 365
 Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp Leu Lys Leu Thr Ser Glu
 370 375 380
 Glu Glu Ser Gln Arg Phe Lys Gly Ser Glu Asn Ser Gln Pro Glu Lys
 385 390 395 400
 Met Ser Gln Glu Pro Glu Ile Asn Lys Asp Gly Asp Arg Glu Val Glu
 405 410 415
 Glu Glu Met Lys Lys His Glu Ser Asn Asn Val Gly Leu Leu Glu Asn
 420 425 430
 Leu Thr Asn Gly Val Thr Ala Gly Asn Gly Asp Asn Gly Leu Ile Pro
 435 440 445
 Gln Arg Lys Ser Arg Thr Pro Glu Asn Gln Gln Phe Pro Asp Asn Glu
 450 455 460
 Ser Glu Glu Tyr His Arg Ile Cys Glu Leu Val Ser Asp Tyr Lys Glu
 465 470 475 480
 Lys Gln Met Pro Lys Tyr Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp
 485 490 495
 Leu Lys Leu Thr Ser Glu Glu Glu Ser Gln Arg Leu Glu Gly Ser Glu
 500 505 510
 Asn Gly Gln Pro Glu Lys Arg Ser Gln Glu Pro Glu Ile Asn Lys Asp
 515 520 525
 Gly Asp Arg Glu Leu Glu Asn Phe Met Ala Ile Glu Glu Met Lys Lys
 530 535 540
 His Gly Ser Thr His Val Gly Phe Pro Glu Asn Leu Thr Asn Gly Ala
 545 550 555 560
 Thr Ala Gly Asn Gly Asp Asp Gly Leu Ile Pro Pro Arg Lys Ser Arg
 565 570 575
 Thr Pro Glu Ser Gln Gln Phe Pro Asp Thr Glu Asn Glu Glu Tyr His
 580 585 590
 Ser Asp Glu Gln Asn Asp Thr Gln Lys Gln Phe Cys Glu Glu Gln Asn
 595 600 605
 Thr Gly Ile Leu His Asp Glu Ile Leu Ile His Glu Glu Lys Gln Ile
 610 615 620
 Glu Val Val Glu Lys Met Asn Ser Glu Leu Ser Leu Ser Cys Lys Lys
 625 630 635 640
 Glu Lys Asp Ile Leu His Glu Asn Ser Thr Leu Arg Glu Glu Ile Ala
 645 650 655
 Met Leu Arg Leu Glu Leu Asp Thr Met Lys His Gln Ser Gln Leu
 660 665 670

<210> 381
 <211> 251
 <212> DNA
 <213> Homo sapien

<400> 381

| | |
|--|-----|
| ggagaagcgt ctgctggggc aggaaggggt ttccctgccc tctcacctgt ccctcaccaa | 60 |
| ggtaacatgc ttcccctaag ggtatcccaa cccagggggc tcaccatgac ctctgagggg | 120 |
| ccaatatccc aggagaagca ttggggaggt gggggcaggt gaaggacca ggactcacac | 180 |
| atcctggggc tccaaggcag aggagaggggt cctcaagaag gtcaggagga aaatccgtaa | 240 |
| caagcagtca g | 251 |

<210> 382
 <211> 3279
 <212> DNA
 <213> Homo sapiens

<400> 382

| | |
|---|------|
| cttcctgcag ccccatgct ggtgaggggc acgggcagga acagtggacc caacatggaa | 60 |
| atgctggagg gtgtcaggaa gtgatcgggc tctggggcag ggaggagggg tggggagtgt | 120 |
| cactgggagg ggacatcctg cagaaggtag gagtgagcaa acaccgctg caggggaggg | 180 |
| gagagccctg cggcacctgg gggagcagag ggagcagcac ctgcccaggc ctgggagggag | 240 |
| gggcctggag ggcgtgagga ggagcgaggg ggctgcatgg ctggagttag ggatcagggg | 300 |
| cagggcgcgga gatggcctca cacagggaag agagggcccc tcctgcaggg cctcacctgg | 360 |
| gccacaggag gacactgctt ttctctgag gagttaggag ctgtggatgg tgctggacag | 420 |
| aagaaggaca gggcctggct cagggtgtcca gaggtgtgag ctggcttccc ttgggatca | 480 |
| gactgcaggg agggagggcg gcagggttgt ggggggagtg acgatgagga tgacctgggg | 540 |
| gtggctccag gccttgcccc tgccctgggc ctcacccagc ctccctcaca gtctcctggc | 600 |
| cctcagcttc tccccccac tccatcctcc atctggcctc agtgggtcat tctgatcact | 660 |
| gaactgacca taccagccc tgcccacggc cctccatggc tccccaatgc cctggagagg | 720 |
| ggacatctag tcagagagta gtccgaaga ggtggcctct gcgatgtgcc tgtgggggca | 780 |
| gcacctgca gatggtccc gcccctcatc tgctgacctg tctgcaggga ctgtcctcct | 840 |
| ggacctggc ccttgctgag gagctggacc ctgaagtccc ctccccatag gccaaagactg | 900 |
| gagccttgtt cctctgttg gactccctgc ccatattctt gtgggagtgg gttctggaga | 960 |
| catttctgtc tgttcctgag agctgggaat tgctctcagt catctgctg cgcggttctg | 1020 |
| agagatggag ttgcctaggc agttattggg gccaatcttt ctactgtgt ctctcctcct | 1080 |
| ttacccttag ggtgattctg ggggtccact tgtctgtaat ggtgtgcttc aaggtatcac | 1140 |
| atcatggggc cctgagccat gtgcccctgc tgaaaagcct gctgtgtaca ccaaggtggg | 1200 |
| gcattaccgg aagtggatca aggacacat cgcagccaac ccctgagtgc ccctgtccca | 1260 |
| cccctacctc tagtaaatat aagtcacat caggttcttg catcacttgg cctttctgga | 1320 |
| tgctggacac ctgaagcttg gaactcacct ggccgaagct cgagcctcct gagtccact | 1380 |
| gacctgtgct ttctgggtgtg gagtccaggg ctgctaggaa aaggaatggg cagacacagg | 1440 |
| tgtatgcaa tgtttctgaa atgggtataa tttcgtcctc tccttcggaa cactggctgt | 1500 |
| ctctgaagac ttctcgctca gtttcagtga ggacacacac aaagacgtgg gtgacctatg | 1560 |
| tgtttgtggg gtgcagagat gggaggggtg gggcccaccc tggaagagtg gacagtgaca | 1620 |
| caaggtggac actctctaca gatcactgag gataagctgg agccacaatg catgaggcac | 1680 |
| acacacagca aggttgacgc tgtaaacata gcccacgctg tcctgggggc actgggaagc | 1740 |
| ctagataagg ccgtgagcag aaagaagggg aggtacctcc tatgttgttg aaggagggac | 1800 |
| tagggggaga aactgaaagc tgattaatta caggaggttt gttaggtcc cccaaccac | 1860 |
| cgtcagattt gatgatttcc tagcaggact tacagaaata aagagctatc atgctgtggg | 1920 |
| ttattatggg ttgttacatt gataggatac atactgaaat cagcaaaca aacagatgta | 1980 |
| tagattagag tgtggagaaa acagagggaaa acttgagtt acgaagactg gcaacttggc | 2040 |
| tttactaagt ttccagactg gcaggaagtc aaacctatta ggctgaggac cttgtggagt | 2100 |
| gtagctgatac cagctgatag aggaactagc cagggtggggg cctttccctt tggatggggg | 2160 |

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gcatatccga cagttattct ctccaagtgg agacttacgg acagcatata attctccctg 2220
caaggatgta tgataatatg tacaaagtaa ttccaactga ggaagctcac ctgaccccta 2280
gtgtccaggg tttttactgg gggctctgtg gacgagtatg gactacttga ataattgacc 2340
tgaagtcctc agacctgagg ttccctagag ttcaaacaga tacagcatgg tccagagtcc 2400
cagatgtaca aaaacagggg ttcatacaca atcccatctt tagcatgaag ggtctggcat 2460
ggcccaaggc cccaagtata tcaaggcact tgggcagaac atgccaagga atcaaatgtc 2520
atctcccagg agttattcaa gggtagagccc ttactttggg atgtacaggc tttgagcagt 2580
gcagggctgc tgagtcaacc ttttattgta caggggatga gggaaagggg gaggatgagg 2640
aagccccctt ggggatttgg tttggtcttg tgatcagggt gtctatgggg ctatccctac 2700
aaagaagaat ccagaaatag gggcacattg aggaatgata ctgagcccaa agagcattca 2760
atcattgttt tatttgcctt cttttcacac cattgggtgag ggagggatta ccaccctggg 2820
gttatgaaga tggttgaaca cccacacat agcaccggag atatgagatc aacagtttct 2880
tagccataga gattcacagc ccagagcagg aggacgctgc acaccatgca ggatgacatg 2940
ggggatgcgc tcgggattgg tgtgaagaag caaggactgt tagaggcagg ctttatagta 3000
acaagacggt ggggcaaact ctgatttccg tgggggaatg tcatggtctt gctttactaa 3060
gttttgagac tggcaggtag tgaaactcat taggctgaga accttggtgga atgcagctga 3120
cccagctgat agaggaagta gccagggtgg agcctttccc agtgggtgtg ggacatatct 3180
ggcaagattt tgtggcactc ctggttacag atactggggc agcaaataaa actgaatctt 3240
gttttcagac cttaaaaaaaa aaaaaaaaaa aaaagtttt 3279

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<210> 383

<211> 155

<212> PRT

<213> Homo sapiens

<400> 383

```

Met Ala Gly Val Arg Asp Gln Gly Gln Gly Ala Arg Trp Pro His Thr
          5                      10                      15

```

```

Gly Lys Arg Gly Pro Leu Leu Gln Gly Leu Thr Trp Ala Thr Gly Gly
          20                      25                      30

```

```

His Cys Phe Ser Ser Glu Glu Ser Gly Ala Val Asp Gly Ala Gly Gln
          35                      40                      45

```

```

Lys Lys Asp Arg Ala Trp Leu Arg Cys Pro Glu Ala Val Ala Gly Phe
          50                      55                      60

```

```

Pro Leu Gly Ser Asp Cys Arg Glu Gly Gly Arg Gln Gly Cys Gly Gly
          65                      70                      75                      80

```

```

Ser Asp Asp Glu Asp Asp Leu Gly Val Ala Pro Gly Leu Ala Pro Ala
          85                      90                      95

```

```

Trp Ala Leu Thr Gln Pro Pro Ser Gln Ser Pro Gly Pro Gln Ser Leu
          100                     105                     110

```

```

Pro Ser Thr Pro Ser Ser Ile Trp Pro Gln Trp Val Ile Leu Ile Thr
          115                     120                     125

```

```

Glu Leu Thr Ile Pro Ser Pro Ala His Gly Pro Pro Trp Leu Pro Asn
          130                     135                     140

```

```

Ala Leu Glu Arg Gly His Leu Val Arg Glu
          145                     150

```

<210> 384
<211> 557
<212> DNA
<213> Homo sapiens

<400> 384
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aaagatgtgt tttgttttgg actctctgtg gtcccttcca atgctgtggg tttccaacca 120
ggggaagggt cccttttgca ttgccaaagt ccataaccat gagcactact ctaccatggg 180
tctgcctcct ggccaagcag gctggtttgc aagaatgaaa tgaatgattc tacagctagg 240
acttaacctt gaaatggaaa gtcttgcaat cccatttgca ggatccgtct gtgcacatgc 300
ctctgtagag agcagcattc ccaggacact tggaaacagt tggcactgta aggtgcttgc 360
tccccaaagac acatcctaaa aggtgttgta atggtgaaaa cgtcttcctt ctttattgcc 420
ccttcttatt tatgtgaaca actgtttgtc tttttttgta tcttttttaa actgtaaagt 480
tcaattgtga aaatgaatat catgcaaata aattatgcga ttttttttcc aaagtaaaaa 540
aaaaaaaaa aaaaaaa 557

<210> 385
<211> 337
<212> DNA
<213> Homo sapiens

<400> 385
ttcccagggt atgtgcgagg gaagacacat ttactatcct tgatggggct gatcccttta 60
gtttctctag cagcagatgg gttaggagga agtgaccaa gtggttgact cctatgtgca 120
tctcaaagcc atctgctgtc ttcgagtacg gacacatcat cactcctgca ttgttgatca 180
aaacgtggag gtgcttttcc tcagctaaga agcccttagc aaaagctcga atagacttag 240
tatcagacag gtccagtttc cgcaccaaca cctgctggtt ccctgctcgt gtctggatct 300
ctttggccac caattcccc tttccacat cccggca 337

<210> 386
<211> 300
<212> DNA
<213> Homo sapiens

<400> 386
gggcccgtca ccggcccagg cccgcctcgc cgagtcctcc tccccgggtg cctgcccgca 60
gcccgctcgg ccagaggggt gggcgcgggg ctgcctctac cggctggcgg ctgtaactca 120
gcgaccttgg ccgaaggct ctacgaagga ccaccgacc ccagccgcgg cggcggcggc 180
gcggactttg ccggtgtgt ggggcggagc ggactgcgtg tccgcggacg ggcagcgaag 240
atgttagcct tcgctgccag gaccgtggac cgatcccagg gctgtggtgt aacctcagcc 300

<210> 387
<211> 537
<212> DNA
<213> Homo sapiens

<400> 387
gggcggagtc gggcaccaag ggactctttg caggcttcc tctcggatc atcaaggctg 60
ccccctcctg tgccatcatg atcagcacct atgagttcgg caaaagcttc ttccagaggc 120
tgaaccagga ccggttctg ggcggctgaa aggggcaagg aggcaaggac cccgtctctc 180
ccacggatgg ggagagggca ggaggagacc cagccaagt ccttttcctc agcactgagg 240
gaggggggct gtttcccttc cctcccggcg acaagctcca gggcagggct gtccctcttg 300


```

gcggcccagc acttcctcag acacaacttc ttcctgctgc tccagtcgtg gggatcatca 360
cttaccacc cccaagttc aagaccaa atccagctg ccccttcgt gttccctgt 420
gtttgctgta gctgggcatg tctccaggaa ccaagaagcc ctcagcctgg ttagtctcc 480
ctgacccttg ttaattcctt aagtctaaag atgatgaact tcaaaaaaaaa aaaaaaa 537

```

<210> 388

<211> 520

<212> DNA

<213> Homo sapiens

<400> 388

```

aggataattt ttaaaccaat caaatgaaaa aaacaaacaa aaaaaaagg aaatgtcatg 60
tgagggtaaa ccagtttgca tccccctaat gtggaaaaag taaggaggact actcagcact 120
gtttgaagat tgccctctct acagcttctg agaattgtgt tatttcactt gccaaagtga 180
ggacccccct cccaacatgc cccagccac ccctaagcat ggtcccttgt caccaggcaa 240
ccaggaaact gctacttggt gacctcacca gagaccagga gggtttggtt agctcacagg 300
acttccccca cccagaaga ttagcatccc atactagact cataactaac tcaactaggc 360
tcataactca ttgatggtta ttagacaatt ccatttcttt ctggttatta taaacagaaa 420
atctttcttc ttctcattac cagtaaaggc tcttggtatc tttctggttg aatgatttct 480
atgaacttgt cttattttaa tgggtgggtt ttttctggt 520

```

<210> 389

<211> 365

<212> DNA

<213> Homo sapiens

<400> 389

```

cgttgccccg gtttgacaga aggaaaggcg gagcttattc aaagtctaga gggagtggag 60
gagttaaggc tggatttcag atctgcctgg ttccagcgc agtggtgccc ctgctcccc 120
aacgactttc caaataatct caccagcgcc ttccagctca ggcgtcctag aagcgtcttg 180
aagcctatgg ccagctgtct ttgtgttccc tctcaccgc ctgtcctcac agctgagact 240
cccaggaaac cttcagacta ccttcctctg ccttcagcaa ggggcgttgc ccacattctc 300
tgagggtcag tggaagaacc tagactccca ttgctagagg tagaaagggg aagggtgctg 360
gggag 365

```

<210> 390

<211> 221

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(221)

<223> n = A,T,C or G

<400> 390

```

tgctctcca tcttgcccc gacttctctg tcaggaaagt ggggatggac cccatctgca 60
tacacgntt ctcatgggtg tggaacatct ctgcttgccg ttccaggaag gcctctggct 120
gctctangag tctgancnga ntcgttgccc cantntgaca naaggaaagg cggagcttat 180
tcaaagtcta gagggagtgg aggagttaag gctggatttc a 221

```

<210> 391

<211> 325

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(325)

<223> n = A,T,C or G

<400> 391

```
tgagcaggt cccgaggcct ccctagagcc tggggccgac tctgtgncga tgcangcttt 60
ctctcgcgcc cagcctggag ctgctcctgg catctaccaa caatcagncg aggcgagcag 120
tagccagggc actgctgcca acagccagtc cnnataccat catgtnaccc ggtgngctct 180
naanttn gat ntccanagcc ctaccatcn tagttctgct ctcccaccgg ntaccagccc 240
cactgcccag gaatcctaca gccagtaccc tgtcccagcg tctctaccta ccagtacgat 300
gagacctccg gctactacta tgacc 325
```

<210> 392

<211> 277

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(277)

<223> n = A,T,C or G

<400> 392

```
atattgttta actccttctt ttatatcttt taacattttc atggngaaag gttcacatct 60
agtctcactt nggcnagn gn ctcctacttg agtctcttcc cggcctgnn ccagtngnaa 120
antaccanga accgncatgn cttaanaacn ncctggtttn tgggttnntc aatgactgca 180
tgacgtgcac caccctgtcc actacgtgat gctgtaggat taaagtctca cagtgggcgg 240
ctgaggatac agcgccgcgt cctgtgttgc tggggaa 277
```

<210> 393

<211> 566

<212> DNA

<213> Homo sapiens

<400> 393

```
actagtccag tgtggtggaa ttcgcggccg cgctcgacgga caggtcagct gtctggctca 60
gtgatctaca ttctgaagtt gtctgaaaat gtcttcatga tttaaattcag cctaaacgtt 120
ttgccgggaa cactgcagag acaatgctgt gagtttccaa ccttagccca tctgcgggca 180
gagaagggtct agtttgtcca tcagcattat catgatatca ggactgggta cttgggtaag 240
gaggggtcta ggagatctgt cccttttaga gacaccttac ttataatgaa gtatttggga 300
gggtgggtttt caaaagtaga aatgtcctgt attccgatga tcatcctgta aacattttat 360
catttattaa tcatccctgc ctgtgtctat tattatattc atatctctac gctggaaact 420
ttctgcctca atgtttactg tgcctttgtt tttgctagtt tgtgtgttg aaaaaaaaaa 480
cattctctgc ctgagtttta atttttgtcc aaagttattt taatctatac aattaaaagc 540
ttttgcctat caaaaaaaaa aaaaaa 566
```

<210> 394

<211> 384

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(384)

<223> n = A,T,C or G

<400> 394

```
gaacatacat gtcccggcac ctgagctgca gtctgacatc atcgccatca cgggcctcgc 60
tgcaaattng gaccggggcca aggctggact gctggagcgt gtgaaggagc tacaggccna 120
gcaggaggac cgggctttta ggagttttta gctgagtgtc actgtagacc ccaaatacca 180
tccaagatt atcgggagaa agggggcagt aattacccaa atccggttgg agcatgacgt 240
gaacatccag tttcctgata aggacgatgg gaaccagccc caggaccaa ttaccatcac 300
agggtacgaa aagaacacag aagctgccag ggatgctata ctgagaattg tgggtgaact 360
tgagcagatg gtttctgagg acgt 384
```

<210> 395

<211> 399

<212> DNA

<213> Homo sapiens

<400> 395

```
ggcaaaactg tgtgacctca ataagacctc gcagatccaa ggtcaagtat cagaagtgc 60
tctgaccttg gactccaaga cctacatcaa cagcctggct atattagatg atgagccagt 120
tatcagaggt ttcattcatt cggaatttgt ggagtctaag gaaatcatgg cctctgaagt 180
attcagctct ttccagtacc ctgagttctc tatagagttg cctaacacag gcagaattgg 240
ccagctactt gtctgcaatt gtatcttcaa gaataccctg gccatccctt tgactgacgt 300
caagttctct ttggaaagcc tgggcatctc ctactacag acctctgacc atgggacggt 360
gcagcctggt gagaccatcc aatcccaaat aaaatgcac 399
```

<210> 396

<211> 403

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(403)

<223> n = A,T,C or G

<400> 396

```
tggagttntc agtgcaaaca agccataaag cttcagtagc aaattactgt ctacagaaa 60
gacattttca acttctgctc cagctgctga taaaacaaat catgtgttta gcttgactcc 120
agacaaggac aacctgttcc ttcataactc tctagagaaa aaaaggagtt gttagtagat 180
actaaaaaaaa gtggatgaat aatctggata ttttctctaa aaagattcct tgaaacacat 240
taggaaaatg gagggcctta tgatcagaat gctagaatta gtccattgtg ctgaagcagg 300
gttttagggga gggagtgagg gataaaagaa ggaaaaaaag aagagtgaga aaacctattt 360
atcaaagcag gtgctatcac tcaatgttag gccctgctct ttt 403
```

<210> 397

<211> 100

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(100)

<223> n = A,T,C or G

<400> 397

actagtnacg tgtggtggaa ttcgcggccg cgtcgacctt naanccatct ctatagcaaa 60
tccatccccg ctcttggttg gtnacagaat gactgacaaa 100

<210> 398

<211> 278

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(278)

<223> n = A,T,C or G

<400> 398

gcggccgcgt cgacagcagt tccgccagcg ctgcgccctg ggtggggatg tgctgcacgc 60
ccacctggac atctggaagt cagcggcctg gatgaaagag cggacttcac ctggggcgat 120
tcactactgt gcctcgacca gtgaggagag ctggaccgac agcgagggtg actcatcatg 180
ctccgggcag cccatccacc tgtggcagtt cctcaaggag ttgctactca agccccacag 240
ctatggccgc ttcattangt ggctcaacaa ggagaagg 278

<210> 399

<211> 298

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(298)

<223> n = A,T,C or G

<400> 399

acggagggtg aggaagcgnc cctgggatcg anaggatggg tcctgncatt gaccncctcn 60
ggggtgccng catggagcgc atgggcgcgg gcctggggcca cggcatggat cgcgtgggct 120
ccgagatcga gcgcattggc ctgggtcatgg accgcattgg ctccgtggag cgcattggct 180
ccggcattga gcgcattggc ccgctgggccc tcgaccacat ggctccanc attgancgca 240
tgggcccagac catggagcgc attggctctg gcgtggagcn catgggtgcc ggcatggg 298

<210> 400

<211> 548

<212> DNA

<213> Homo sapiens

<400> 400

acatcaacta ctctctcatt ttaaggtatg gcagttccct tcateccctt ttcctgcctt 60
gtacatgtac atgtatgaaa ttctcttctc ttaccgaact ctctccacac atcacaaggc 120
caaagaacca cagccttaga agggtaagag ggcaccctat gaaatgaaat ggtgatttct 180
tgagtctctt ttttccacgt ttaaggggccc atggcaggac ttagagttgc gagttaagac 240
tgcagagggc tagagaatta tttcatacag gctttgaggc caccatgtc acttatcccc 300
tataccctct caccatcccc ttgtctactc tgatgcccc aagatgcaac tgggcagcta 360
gttggcccca taattctggg cctttgttgt ttgttttaat tacttgggca tcccaggaag 420
ctttccagtg atctcctacc atgggcccc ctcttgggat caagccctc ccaggccctg 480
tccccagccc ctctgcccc agcccacccg ctgtccttgg tgctcagccc tccattggg 540
agcaggtt 548

<210> 401
<211> 355
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(355)
<223> n = A,T,C or G

<400> 401
actgtttcca tggtatgttt ctacacattg ctacctcagt gtccttgga acttagcttt 60
tgatgtctcc aagtagtcca ccttcattta actctttgaa actgtatcat ctttgccaag 120
taagagtggg ggcctatttc agctgctttg acaaaatgac tggctcctga cttaacgttc 180
tataaatgaa tgtgctgaag caaagtgcc atggtggcgg cgaagaagan aaagatgtgt 240
tttgttttgg actctctgtg gtcccttcca atgctgnngg tttccaacca ggggaagggt 300
cccttttgca ttgccaagtg ccataacat gagcactact ctaccatggn tctgc 355

<210> 402
<211> 407
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(407)
<223> n = A,T,C or G

<400> 402
atggggcaag ctggataaag aaccaagacc cactggagta tgctgtcttc aagaaaccca 60
tctcacatgc ggtggcatat ataggctcaa aataaaggaa tggagaaaaa ttttcaagc 120
aaatggaaaa cagaaaaaag caggtgttgc actcctactt tctgacaaaa cagactatgc 180
gaataaagat aaaaaagaga aggacattac aaagggtggc ctgacctttg ataaatctca 240
ttgcttgata ccaacctggg ctgttttaat tgcccaaaacc aaaaggataa tttgctgagg 300
ttgtggagct tctccctgc agagagtccc tgatctccca aaatttggtt gagatgtaag 360
gntgattttg ctgacaactc cttttctgaa gttttactca tttccaa 407

<210> 403
<211> 303
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(303)
<223> n = A,T,C or G

<400> 403
cagtatttat agccnaactg aaaagctagt agcaggcaag tctcaaatcc aggcacacaa 60
tcctaagcaa gagccatggc atggtgaaaa tgcaaaagga gagtctggcc aatctacaaa 120
tagagaacaa gacctactca gtcataaaca aaaaggcaga caccaacatg gatctcatgg 180
gggattggat attgtaatta tagagcagga agatgacagt gatcgtcatt tggcacacaa 240
tcttaacaac gaccgaaacc cattattttac ataaacctcc attcggtaac catgttgaaa 300
gga 303

<210> 404
<211> 225
<212> DNA
<213> Homo sapiens

<400> 404
aagtgttaact tttaaaaatt tagtggattt tgaaaattct tagaggaaag taaaggaaaa 60
attgttaatg cactcattta cctttacatg gtgaaagttc tctcttgatc ctacaaacag 120
acattttcca ctcgtgtttc catagtgtgt aagtgtatca gatgtgttgg gcatgtgaat 180
ctccaagtgc ctgtgtaata aataaagtat ctttatttca ttcac 225

<210> 405
<211> 334
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(334)
<223> n = A,T,C or G

<400> 405
gagctgttat actgtgagtt ctactaggaa atcatcaaat ctgaggggtg tctggaggac 60
ttcaatacac ctccccccat agtgaatcag cttccagggg gtccagtccc tctccttact 120
tcattcccat cccatgccaa aggaagacct tccctccttg gtcacagcc ttctctaggc 180
ttcccagtcg ctccaggaca gagtgggtta tgttttcagc tccatccttg ctgtgagtgt 240
ctggtgcggt tgtgcctcca gcttctgctc agtgcttcat ggacagtgtc cagcccatgt 300
cactctccac tctctcanng tggatccac ccct 334

<210> 406
<211> 216
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(216)
<223> n = A,T,C or G

<400> 406
tttcatacct aatgaggag ttganatnac atnnaaccag gaaatgcatg gatctcaang 60
gaaacaaaca cccaataaac tcggagtggc agactgacaa ctgtgagaca tgcacttgct 120
acnaaacaca aatttnatgt tgcacccttg tttctacacc tgtgggttat gacaaagaca 180
actgccaaag aatnttcaag aaggaggact gccant 216

<210> 407
<211> 413
<212> DNA
<213> Homo sapiens

<400> 407
gctgacttgc tagtatcatc tgcattcatt gaagcacaag aacttcatgc cttgactcat 60
gtaaatgcaa taggattaaa aaataaattt gatatcacat ggaaacagac aaaaaatatt 120
gtacaacatt gcacccagtg tcagattcta cacctggcca ctcaggaagc aagagttaat 180
cccagaggtc tatgtcctaa tgtgttatgg caaatggatg tcatgcacgt accttcattt 240

ggaaaattgt catttgtcca tgtgacagtt gatacttatt cacatttcat atgggcaacc 300
tgccagacag gagaaagtct tcccatgtta aaagacattt attatcttgt tttcctgtca 360
tgggagttcc agaaaaagtt aaaacagaca atgggccagg ttctgtagta aag 413

<210> 408
<211> 183
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(183)
<223> n = A,T,C or G

<400> 408
ggagctngcc ctcaattcct ccatntctat gttancatat ttaatgtctt ttgnnattaa 60
tncttaacta gttaatcctt aaagggctan ntaatcctta actagtccct ccattgtgag 120
cattatcctt ccagtatctn ccttctnttt tatttactcc ttcttggtta cccatgtact 180
ntt 183

<210> 409
<211> 250
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(250)
<223> n = A,T,C or G

<400> 409
cccacgcatg ataagctctt tatttctgta agtcctgcta ggaaatcatc aaatctgacg 60
gtgggtttgg ggacctgaac aaacctcctg taattaatca gctttcagtt tctcccccta 120
gtccctcctt caacaacata ggaggatcct ccccttcttt ctgctcacgg ccttatctag 180
gcttcccagt gccccagga cagcgtgggc tatgtttaca gcgcntcctt gctggggggg 240
ggcctatgc 250

<210> 410
<211> 306
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(306)
<223> n = A,T,C or G

<400> 410
ggctgggttg caagaatgaa atgaatgatt ctacagctag gacttaacct tgaaatggaa 60
agtcttgcaa tcccatttgc aggatccgtc tgtgcacatg cctctgtaga gagcagcatt 120
cccagggacc ttggaaacag ttggcactgt aagggtgctg ctccccaaaga cacatcctaa 180
aagggtgttg aatggtgaaa accgcttctt tctttattgc cccttcttat ttatgtgaac 240
nactgggttg ctttttttgn atctttttta aactggaaag ttcaattgng aaaatgaata 300
tcntgc 306

<210> 411
<211> 261
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(261)
<223> n = A,T,C or G

<400> 411
agagatattn cttaggtnaa agttcataga gttcccatga actatatgac tggccacaca 60
ggatcttttg tatttaagga ttctgagatt ttgcttgagc aggattagat aaggctgttc 120
tttaaagtgc tgaaatggaa cagatttcaa aaaaaaaccc cacaatctag ggtgggaaca 180
aggaaggaaa gatgtgaata ggctgatggg caaaaaacca atttaccat cagttccagc 240
cttctctcaa ggngaggcaa a 261

<210> 412
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 412
gttcaatgtt acctgacatt tctacaacac cccactcacc gatgtattcg ttgcccagtg 60
ggaacatacc agcctgaatt tggaaaaaat aattgtgttt cttgcccagg aaatactacg 120
actgactttg atggctccac aaacataacc cagtgtaaaa acagaagatg tggaggggag 180
ctgggagatt tcaactggga cattgaattc ccaaactacc cangcaatta cccagccaac 240
a 241

<210> 413
<211> 231
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(231)
<223> n = A,T,C or G

<400> 413
aactcttaca atccaagtga ctcactctgtg tgcttgaatc ctttccactg tctcatctcc 60
ctcatccaag tttctagtac cttctctttg ttgtgaagga taatcaaact gaacaacaaa 120
aagtttactc tctctatttg gaacctaaaa actctcttct tctgggtct gaggggtcca 180
agaatccttg aatcanttct cagatcattg gggacaccan atcaggaacc t 231

<210> 414
<211> 234
<212> DNA
<213> Homo sapiens

<400> 414

```
actgtccatg aagcactgag cagaagctgg aggcacaacg caccagacac tcacagcaag 60
gatggagctg aaaacataac ccactctgtc ctggaggcac tgggaagcct agagaaggct 120
gtgagccaag gagggagggt cttcctttgg catgggatgg ggatgaagta aggagaggga 180
ctggaccccc tggaagctga ttcactatgg ggggagggtg attgaagtcc tcca      234
```

<210> 415

<211> 217

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(217)

<223> n = A,T,C or G

<400> 415

```
gcataggatt aagactgagt atcttttcta cattctttta acttttctaag gggcacttct 60
caaaacacag accaggtagc aaatctccac tgctctaagg ntctcaccac cacttttctca 120
cacctagcaa tagtagaatt cagtcctact tctgaggcca gaagaatggt tcagaaaaat 180
antggattat aaaaaataac aattaagaaa aataatc      217
```

<210> 416

<211> 213

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(213)

<223> n = A,T,C or G

<400> 416

```
atgcatatnt aaagganact gcctcgcttt tagaagacat ctggngctgct ctctgcatga 60
ggcacagcag taaagctctt tgattcccag aatcaagaac tctccccttc agactattac 120
cgaatgcaag gtggttaatt gaaggccact aattgatgct caaatagaag gatattgact 180
atattggaac agatggagtc tctactacaa aag      213
```

<210> 417

<211> 303

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(303)

<223> n = A,T,C or G

<400> 417

```
nagtcttcag gcccatcagg gaagttcaca ctggagagaa gtcatacata tgtactgtat 60
gtgggaaagg ctttactctg agttcaaatc ttcaagccca tcagagagtc cacactggag 120
agaagccata caaatgcaat gagtgtggga agagcttcag gagggattcc cattatcaag 180
ttcatctagt ggtccacaca ggagagaaac cctataaatg tgagatatgt gggaagggtc 240
tcantcaaag ttcgtatctt caaatccatc ngaaggncca cagtatanan aaacctttta 300
agt      303
```

<210> 418
<211> 328
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(328)
<223> n = A,T,C or G

<400> 418
tttttggcgg tgggtggggca gggacgggac angagtctca ctctgttgcc caggctggag 60
tgcacaggca tgatctcggc tcaactaac cctgcctcc catgtccaag cgattcttgt 120
gcctcagcct tccctgtagc tagaattaca ggcacatgcc accacaccca gctagttttt 180
gtatttttag tagagacagg gtttcacat gttggccagg ctggtctcaa actcctnacc 240
tcagnggtca ggctgggtct aaactcctga cctcaagtga tctgcccacc tcagcctccc 300
aaagtgctan gattacaggc cgtgagcc 328

<210> 419
<211> 389
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(389)
<223> n = A,T,C or G

<400> 419
cctcctcaag acggcctgtg gtccgcctcc cggcaaccaa gaagcctgca gtgccatag 60
accctgagc catggactgg agcctgaaag gcagcgtaca ccctgctcct gatcttgctg 120
cttgtttct ctctgtggct ccattcatag cacagtgtgt gcaactgaggc ttgtgcaggc 180
cgagcaaggc caagctggct caaagagcaa ccagtcaact ctgccacggg gtgccaggca 240
ccggttctcc agccaccaac ctcaactcgt cccgcaaagt gcacatcagt tcttctaccc 300
taaaggtagg accaaagggc atctgctttt ctgaagtcct ctgctctatc agccatcacg 360
tggcagccac tcnggctgtg tcgacgcgg 389

<210> 420
<211> 408
<212> DNA
<213> Homo sapiens

<400> 420
gttcctccta actcctgcc aaaaacagctc tctcaacat gagagctgca cccctcctcc 60
tggccagggc agcaagcctt agccttggct tcttgtttct gctttttttc tggctagacc 120
gaagtgtact agccaaggag ttgaagtgtg tgactttggt gtttcggcat ggagaccgaa 180
gtcccattga cacctttccc actgaccca taaaggaatc ctcatggcca caaggatttg 240
gccaactcac ccagctgggc atggagcagc attatgaact tggagagtat ataagaaaga 300
gatatagaaa attcttgaat gagtcctata aacatgaaca ggtttatatt cgaagcacag 360
acgttgaccg gactttgatg aagtgtatg acaaacctgg caagcccg 408

<210> 421
<211> 352
<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(352)

<223> n = A,T,C or G

<400> 421

```
gctcaaaaat ctttttactg atnggcatgg ctacacaatc attgactatt acggaggcca 60
gaggagaatg aggcctggcc tgggagccct gtgcctacta naagcacatt agattatcca 120
ttcactgaca gaacaggtct tttttgggtc cttcttctcc accacnatac acttgagtc 180
ctccttcttg aagattcttt ggcagttgtc tttgtcataa cccacaggtg tagaaacaag 240
ggtgcaacat gaaatttctg tttcgtagca agtgcattgc tcacaagttg gcangtctgc 300
cactccgagt ttattgggtg tttgtttcct ttgagatcca tgcatttcct gg 352
```

<210> 422

<211> 337

<212> DNA

<213> Homo sapiens

<400> 422

```
atgccaccat gctggcaatg cagcgggaggc tccaaggcct gcatatccag cccaagctgg 60
cgatgatcga cggcaaccgt tgcccgaagt tgccgatgcc agccgaagcg gtgggtcaagg 120
gcgatagcaa ggtgccggcg atcgcgggcg cgtcaatcct ggccaaggtc agccgtgatc 180
gtgaaatggc agctgtcgaa ttgatctacc cgggttatgg catcgggcggg cataagggct 240
atccgacacc ggtgcacctg gaagccttgc agcggctggg gccgacgccc attcaccgac 300
gcttcttccg ccggtacggc tggcctatga aaattat 337
```

<210> 423

<211> 310

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(310)

<223> n = A,T,C or G

<400> 423

```
gctcaaaaat ctttttactg atatggcatg gctacacaat cattgactat tagaggccag 60
aggagaatga ggctggcct gggagccctg tgccctactan aagcncatta gattatccat 120
tactgacag aacaggtctt ttttgggtcc ttcttctcca ccacgatata cttgcagtc 180
tccttcttga agattctttg gcagttgtct ttgtcataac ccacaggtgt anaaacaagg 240
gtgcaacatg aaatttctgt ttcgtagcaa gtgcatgtct cacagttgtc aagtctgccc 300
tccgagttta 310
```

<210> 424

<211> 370

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(370)

<223> n = A,T,C or G

<400> 424

```
gctcaaaaat ctttttactg atagggcatgg ctacacaatc attgactatt agaggccaga 60
ggagaatgag gcctggcctg ggagccctgt gcctactaga agcacattag attatccatt 120
cactgacaga acaggtcttt tttgggtcct tcttctccac cacgatatac ttgcagtcct 180
ccttcttgaa gattcttttg cagttgtctt tgtcataacc cacaggtgta gaaacatcct 240
ggttgaatct cctggaactc cctcattagg tatgaaatag catgatgcat tgcataaagt 300
cacgaagggtg gcaaagatca caacgctgcc cagganaaca ttcattgtga taagcaggac 360
tccgtcgacg                                     370
```

<210> 425

<211> 216

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(216)

<223> n = A,T,C or G

<400> 425

```
aattgctatn ntttattttg ccactcaaaa taattaccaa aaaaaaaaaa tnttaaata 60
taacaacnca acatcaaggn aananaaca ggaatggntg acntgcata aatnggccga 120
anattatcca ttatnttaag ggttgacttc aggntacagc acacagacaa acatgcccag 180
gaggntntca ggaccgctcg atgtnttntg aggagg                                     216
```

<210> 426

<211> 596

<212> DNA

<213> Homo sapiens

<400> 426

```
cttccagtga ggataaccct gttgccccgg gccgagggtc tccattaggc tctgattgat 60
tggcagtcag tgatggaagg gtgttctgat cattccgact gcccgaaggg tcgctggcca 120
gctctctgtt ttgctgagtt ggcagtagga cctaatttgt taattaagag tagatgggtga 180
gctgtccctg tattttgatt aacctaatgg ccttcccagc acgactcggg ttcagctgga 240
gacatcacgg caacttttaa tgaaatgatt tgaagggccg ttaagaggca cttcccgtta 300
ttaggcagtt catctgcact gataacttct tggcagctga gctggtcgga gctgtggccc 360
aaacgcacac ttggcttttg gttttgagat acaactctta atcttttagt catgcttgag 420
ggtggatggc cttttcagct ttaacccaat ttgcactgcc ttggaagtgt agccaggaga 480
atacactcat atactcgtgg gcttagaggc cacagcagat gtcattgggt tactgcctga 540
gtcccgtctg tcccatccca ggaccttcca tcggcgagta cctgggagcc cgtgct     596
```

<210> 427

<211> 107

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(107)

<223> n = A,T,C or G

<400> 427

```
gaagaattca agttaggttt attcaaaggg cttacngaga atcctanacc caggncccag 60
```

cccgaggagca gccttanaga gctcctgttt gactgcccgg ctcagng

107

<210> 428

<211> 38

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(38)

<223> n = A,T,C or G

<400> 428

gaacttcna anaangactt tattcactat ttacatt

38

<210> 429

<211> 544

<212> DNA

<213> Homo sapiens

<400> 429

ctttgctgga cggaataaaa gtggacgcaa gcatgaccto ctgatgaggg cgctgcattt 60
attgaagagc ggctgcagcc ctgcggttca gattaaaatc cgagaattgt atagacgccg 120
atatccacga actccttgaag gactttctga ttatccaca atcaaatcat cggttttcag 180
tttggatggt ggctcatcac ctgtagaacc tgacttggcc gtggctggaa tccactcgtt 240
gccttccact tcagttacac ctcaatcacc atcctctcct gttggttctg tgctgcttca 300
agataactaag cccacatttg agatgcagca gccatctccc ccaattcctc ctgtccatcc 360
tgatgtgcag ttaaaaaatc tgccctttta tgatgtcctt gatgttctca tcaagcccac 420
gagtttagtt caaagcagta ttcagcgatt tcaagagaag ttttttattt ttgctttgac 480
acctcaacaa gttagagaga tatgcatatc cagggatttt ttgccagggtg gtaggagaga 540
ttat 544

<210> 430

<211> 507

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 430

cttatcncaa tggggctccc aaacttggct gtgcagtgga aactccgggg gaattttgaa 60
gaacactgac acccatcttc caccocgaca ctctgattta attgggctgc agtgagaaca 120
gagcatcaat ttaaaaagct gcccagaatg ttntcctggg cagcgttgtg atctttgcn 180
ccttcgtgac tttatgcaat gcatcatgct atttcatacc taatgagggg gttccaggag 240
attcaaccag gatgtttcta cncctgtggg ttatgacaaa gacaactgcc aaagaatntt 300
caagaaggag gactgcaagt atatcgtggt ggagaagaag gaccacaaaa agacctgttc 360
tgtcagtga tggataatct aatgtgcttc tagtaggcac agggctccca ggccaggcct 420
cattctcttc tggcctctaa tagtcaatga ttgtgtagcc atgcctatca gtaaaaagat 480
ttttgagcaa aaaaaaaaaa aaaaaaa 507

<210> 431

<211> 392

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(392)

<223> n = A,T,C or G

<400> 431

```
gaaaattcag aatggataaa aacaaatgaa gtacaaaata tttcagattt acatagcgat 60
aaacaagaaa gcacttatca ggaggactta caaatggaag tacactctan aaccatcatc 120
tatcatggct aaatgtgaga ttagcacagc tgtattattt gtacattgca aacacctaga 180
aagagatggg aaacaaaatc ccaggagttt tgtgtgtgga gtccctgggtt ttccaacaga 240
catcattcca gcattctgag attagggnga ttggggatca ttctggagtt ggaatgttca 300
acaaaagtga tgttgttagg taaaatgtac aacttctgga tctatgcaga cattgaaggt 360
gcaatgagtc tggcttttac tctgctgttt ct 392
```

<210> 432

<211> 387

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(387)

<223> n = A,T,C or G

<400> 432

```
ggtatcanta cataatcaaa tatagctgta gtacatgttt tcattggngt agattaccac 60
aaatgcaagg caacatgtgt agatctcttg tcttattctt ttgtctataa tactgtattg 120
ngtagtccaa gctctcggna gtccagccac tgngaaacat gtcctcttta gattaacctc 180
gtggacnctn ttgttgnatt gtctgaactg tagngccctg tatcttgctt ctgtctgnga 240
attctgttgc ttctggggca ttctcttng atgcagagga ccaccacaca gatgacagca 300
atctgaattg ntccaatcac agctgcgatt aagacatact gaaatcgtac aggaccggga 360
acaacgtata gaacactgga gtccttt 387
```

<210> 433

<211> 281

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(281)

<223> n = A,T,C or G

<400> 433

```
ttcaactagc anagaanact gcttcagggn gtgtaaaatg aaaggcttcc acgcagttat 60
ctgattaaag aacactaaga gagggacaag gctagaagcc gcaggatgtc tacactatag 120
caggcnctat ttgggttggc tggaggagct gtggaaaaca tggagagatt ggcgctggag 180
atcgccgtgg ctattcctcn ttgntattac accagnagg ntctctgtnt gccactgggt 240
tnnaaaaccg ntatacaata atgatagaat aggacacaca t 281
```

<210> 434

<211> 484

<212> DNA

<213> Homo sapiens

<400> 434

```
ttttaaaata agcatttagt gctcagtcctt tactgagtag tctttctctc ccttcctctg 60
aatttaattc tttcaacttg caatttgcaa ggattacaca tttcactgtg atgtatattg 120
tggtgcaaaa aaaaaaaagt gtctttgttt aaaattactt ggtttgtgaa tccatcttgc 180
tttttcccca ttggaactag tcattaaccc atctctgaac tggtagaaaa acatctgaag 240
agctagtcta tcagcatctg acaggtgaat tggatgggtc tcagaacccat ttcacccaga 300
cagcctgttt ctatcctgtt taataaatta gtttgggttc tctacatgca taacaaaccc 360
tgctccaatc tgctacataa aagtctgtga cttgaagttt agtcagcacc cccaccaaac 420
tttatttttc tatgtgtttt ttgcaacata tgagtgtttt gaaaataaag taccatgtc 480
ttaa 484
```

<210> 435

<211> 424

<212> DNA

<213> Homo sapiens

<400> 435

```
gcgcgcgtca gagcaggtca ctttctgcct tccacgtcct ccttcaagga agcccatgt 60
gggtagcttt caatatcgca gggtcttact cctctgcctc tataagctca aaccaccaa 120
cgatcgggca agtaaacccc ctccctcgcc gacttcggaa ctggcgagag ttcagcgag 180
atgggcctgt ggggaggggg caagatagat gagggggagc ggcatggtgc ggggtgaccc 240
cttgagagga ggaaaaaggc cacaagaggg gctgccaccg ccactaacgg agatggccct 300
ggtagagacc tttgggggtc tggaaacctc ggactcccca tgctctaact cccacactct 360
gctatcagaa acttaaacct gaggatcttc tctgtttttc actcgcaata aattcagagc 420
aaac 424
```

<210> 436

<211> 667

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(667)

<223> n = A,T,C or G

<400> 436

```
accttgggaa nactctcaca atataaaggg tcgtagactt tactccaaat tccaaaaagg 60
tcctggccat gtaatcctga aagttttccc aaggtagcta taaaatcctt ataaggggtg 120
agcctcttct ggaattcttc tgatttcaaa gtctcactct caagttcttg aaaacgaggg 180
cagttcctga aaggcaggta tagcaactga tcttcagaaa gaggaactgt gtgcaccggg 240
atgggctgcc agagtaggat aggattccag atgctgacac cttctggggg aaacaggggt 300
gccaggtttg tcatagcact catcaaagtc cggtcacagt ctgtgcttcg aatataaacc 360
tgttcatggt tataggactc attcaagaat tttctatata tctttcttat atactctcca 420
agttcataat gctgctccat gccagctgg gtgagttggc caaatccttg tggccatgag 480
gattccttta tggggtcagt gggaaagggt tcaatgggac ttcggtctcc atgccgaaac 540
accaaagtca caaacttcaa ctcttggtc agtacacttc ggtctagcca gaaaaaaagc 600
agaaacaaga agccaaggct aaggcttgct gccctgccag gaggaggggt gcagctctca 660
tggtgag 667
```

<210> 437

<211> 693

<212> DNA

<213> Homo sapiens

<400> 437

```

ctacgtctca accctcattt ttaggtaagg aatcttaagt ccaaagatat taagtgactc 60
acacagccag gtaaggaaag ctggattggc acactaggac tctaccatac cgggttttgt 120
taaagctcag gttaggaggc tgataagctt ggaaggaact tcagacagct ttttcagatc 180
ataaaaagata attcttagcc catgttcttc tccagagcag acctgaaatg acagcacagc 240
aggtactcct ctatttttcac cctctttgct tctactctct ggcagtcaga cctgtgggag 300
gccatgggag aaagcagctc tctggatgtt tgtacagatc atggactatt ctctgtggac 360
cattttccca ggttacccta ggtgtcacta ttggggggac agccagcatc tttagctttc 420
atttgagttt ctgtctgtct tcagtagagg aaacttttgc tcttcacact tcacatctga 480
acacctaaact gctgttgctc ctgaggtggt gaaagacaga tatagagctt acagtattta 540
tcctattttc aggcactgag ggctgtgggg taccttgtgg tgccaaaaca gatcctgttt 600
taaggacatg ttgcttcaga gatgtctgta actatctggg ggctctgttg gctctttacc 660
ctgcatcatg tgctctcttg gctgaaaatg acc 693

```

<210> 438

<211> 360

<212> DNA

<213> Homo sapiens

<400> 438

```

ctgcttatca caatgaatgt tctcctgggc agcgtttgtga tctttgccac ctctgtgact 60
ttatgcaatg catcatgcta tttcatacct aatgagggag ttccaggaga ttcaaccagg 120
atgtttctac acctgtgggt tatgacaaag acaactgcc aagaatcttc aagaaggagg 180
actgcaagta tatctgtgtg agaagaagga cccaaaaaag acctgttctg tcagtgaatg 240
gataatctaa tgtgcttcta gtaggcacag ggctcccag ccaggcctca ttctcctctg 300
gcctctaata gtcaataatt gtgtagccat gcctatcagt aaaaagattt ttgagcaaac 360

```

<210> 439

<211> 431

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(431)

<223> n = A,T,C or G

<400> 439

```

gttcctnnta actcctgcc aaaacagctc tctcaacat gagagctgca cccctcctcc 60
tgccagggc agcaagcctt agccttggct tcttgtttct gcttttttcc tggctagacc 120
gaagtgtact agccaaggag ttgaagtttg tgactttggt gtttcggcat ggagaccgaa 180
gtcccattga cacctttccc actgacccca taaaggaatc ctcatggcca caaggatttg 240
gccaaactcac ccagctgggc atggagcagc attatgaact tggagagtat ataagaaaga 300
gatatagaaa attcttgaat ggtcctata aacatgaaca ggtttatatt cgaagcacag 360
acgttgaccg gactttgatg agtgctatga caaacctggc agcccgctga cgcggccgcg 420
aatttagtag t 431

```

<210> 440

<211> 523

<212> DNA

<213> Homo sapiens

<400> 440

```
agagataaag cttaggtcaa agttcataga gttcccatga actatatgac tggccacaca 60
ggatcttttg tatttaagga ttctgagatt ttgcttgagc aggattagat aaggctgttc 120
tttaaatgtc tgaaatggaa cagatttcaa aaaaaaaccc cacaatctag ggtgggaaca 180
aggaaggaaa gatgtgaata ggctgatggg caaaaaacca atttacccat cagttccagc 240
cttctctcaa ggagaggcaa agaaaggaga tacagtggag acatctggaa agttttctcc 300
actggaaaac tgctactatc tgtttttata tttctgttaa aatatatgag gctacagaac 360
taaaaattaa aacctctttg tgtcccttgg tcctgggaaca tttatgttcc ttttaaagaa 420
acaaaaatca aactttacag aaagatttga tgtatgtaac acatatagca gctcttgaag 480
tatatatatc atagcaaata agtcactctga tgagaacaag cta 523
```

<210> 441

<211> 430

<212> DNA

<213> Homo sapiens

<400> 441

```
gttcctccta actcctgcc aacacagctc tcctcaacat gagagctgca cccctcctcc 60
tggccagggc agcaagcctt agccttggtc tcttggttct gctttttttc tggctagacc 120
gaagtgtact agccaaggag ttgaagtttg tgacttttgt gtttcggcat ggagaccgaa 180
gtcccatatga cacttttccc actgacccca taaagggaatc ctcatggcca caaggatttg 240
gccaactcac ccagctgggc atggagcagc attatgaact tggagagtat ataagaaaga 300
gatatagaaa attcctgaat gagtccata aacatgaaca ggtttatatt cgaagcacag 360
acgttgaccg gactttgatg agtgctatga caaacctggc agcccgtcga cgcgcccgcg 420
aathtagtag 430
```

<210> 442

<211> 362

<212> DNA

<213> Homo sapiens

<400> 442

```
ctaaggaatt agtagtggtc ccatcacttg tttggagtgt gctattctaa aagattttga 60
tttcctggaa tgacaattat attttaactt tgggtgggga aagagttata ggaccacagt 120
cttcacttct gatacttgta aattaatctt ttattgcact tgttttgacc attaagctat 180
atgtttagaa atggtcattt tacggaaaaa ttagaaaaat tctgataata gtgcagaata 240
aatgaattaa tgttttactt aatttatatt gaactgtcaa tgacaaataa aaattctttt 300
tgattatttt ttgttttcat ttaccagaat aaaaactaag aattaaaagt ttgattacag 360
tc 362
```

<210> 443

<211> 624

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(624)

<223> n = A,T,C or G

<400> 443

```
tttttttttt gcaacacaat atacatcaca gtgaaatgtg taatccttgc aaattgcaag 60
ttgaaagaat taaattcaga ggaggggaga gaaagagtac tcagtaggga ctgagcacta 120
aatgcttatt ttaaaagaaa tgtaaagagc agaaagcaat tcaggctacc ctgccttttg 180
tgctggctag tactccggtc ggtgtcagca gcacgtggca ttgaacattg caatgtggag 240
```

```

cccaaaccac agaaaatggg gtgaaattgg ccaactttct attaaacttg cttcctgttt 300
tataaaatat tgtgaataat atcacctact tcaaagggca gttatgaggc ttaaatgaac 360
taacgcctac aaaacactta aacatagata acatagggtgc aagtactatg tatctgggtac 420
atggtaaaca tccttattat taaagtcaac gctaaaatga atgtgtgtgc atatgctaata 480
agtacagaga gagggcactt aaaccaacta agggcctgga ggggaagggtt cctggaaaga 540
ngatgcttgt gctgggtcca aatcttggtc tactatgacc ttggccaaat tatttaaact 600
ttgtccctat ctgctaaaca gatc 624

```

<210> 444

<211> 425

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(425)

<223> n = A,T,C or G

<400> 444

```

gcacatcatt nntcttgcatt tctttgagaa taagaagatc agtaaatagt tcagaagtgg 60
gaagctttgt ccaggcctgt gtgtgaaccg aatgttttgc ttagaaatag aacaagtaag 120
ttcattgcta tagcataaca caaaatttgc ataagtgggtg gtcagcaaat ccttgaatgc 180
tgcttaatgt gagagggttg taaaatcctt tgtgcaacac tctaactccc tgaatgtttt 240
gctgtgctgg gacctgtgca tgccagacaa ggccaagctg gctgaaagag caaccagcca 300
cctctgcaat ctgccacctc ctgctggcag gatttgtttt tgcatectgt gaagagccaa 360
ggaggcacca gggcataagt gagtagactt atggtcgacg cggccgcgaa tttagtagta 420
gtaga 425

```

<210> 445

<211> 414

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(414)

<223> n = A,T,C or G

<400> 445

```

catgtttatg nttttggatt actttgggca cctagtgttt ctaaatcgtc tatcattctt 60
ttctgttttt caaaagcaga gatggccaga gtctcaacaa actgtatctt caagtctttg 120
tgaaattctt tgcattgtggc agattattgg atgtagtctt ctttaactag catataaatc 180
tggtgtgttt cagataaatg aacagcaaaa tgtgggtggaa ttaccatttg gaacattgtg 240
aatgaaaaat tgtgtctcta gattatgtaa caaataacta tttcctaacc attgatcttt 300
ggatttttat aatcctactc acaaatgact aggtctctcc tcttgtattt tgaagcagtg 360
tggtgtgtgg attgataaaa aaaaaaaaaa tgcacgcggc cgcaatttta gtag 414

```

<210> 446

<211> 631

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(631)

<223> n = A,T,C or G

<400> 446

```
acaaattaga anaaagtgcc agagaacacc acataccttg tccggaacat tacaatggct 60
tctgcatgca tgggaagtgt gagcattcta tcaatatgca ggagccatct tgcaggtgtg 120
atgctgggta tactggacaa cactgtgaaa aaaaggacta cagtgttcta tacgttgttc 180
ccggctcctgt acgatttcag tatgtcttaa tcgcagctgt gattggaaca attcagattg 240
ctgtcatctg tgtgggtggc ctctgcatca caagggccaa actttaggta atagcattgg 300
actgagattt gtaaaacttc caaccttcca ggaaatgccc cagaagcaac agaattcaca 360
gacagaagca aaatacaggg cactacagtt cagacaatac aacaagagcg tccacgaggt 420
taatctaaag ggagcatggt tcacagtggc tggactaccg agagcttgga ctacacaata 480
cagtattata gacaaaagaa taagacaaga gatctacaca tgttgccctg catttgtggg 540
aatctacacc aatgaaaaca tgtactacag ctatatattga ttatgtatgg atatatttga 600
aatagtatac attgtcttga tgttttttct g 631
```

<210> 447

<211> 585

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(585)

<223> n = A,T,C or G

<400> 447

```
ccttgggaaa antntcacaa tataaagggt cgtagacttt actccaaatt ccaaaaagggt 60
cctggccatg taatcctgaa agttttccca aggtagctat aaaatcctta taagggtgca 120
gcctcttctg gaattcctct gatttcaaag tctcactctc aagttcttga aaacgagggc 180
agttcctgaa aggcaggtat agcaactgat cttcagaaag aggaactgtg tgcaccggga 240
tggtgctgca gagtaggata ggattccaga tgctgacacc ttctggggga aacagggctg 300
ccagggttgt catagcactc atcaaagtcc ggtcaacgtc tgtgcttcga atataaacct 360
gttcatgttt ataggactca ttcaagaatt ttctatatct ctttcttata tactctccaa 420
gttcataatg ctgctccatg cccagctggg tgagttggcc aaatccttgt ggccatgagg 480
attcctttat ggggtcagtg ggaaagggtg caatgggact tcggtctcca tgccgaaaca 540
ccaaagtcac aaacttcaac tccttggtga gtacacttcg gtcta 585
```

<210> 448

<211> 93

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(93)

<223> n = A,T,C or G

<400> 448

```
tgctcgtggg tcattctgan ncccgaactg acctgcccag ccttgccgan gggccnccat 60
ggctccctag tgccctggag agganggggc tag 93
```

<210> 449

<211> 706

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(706)

<223> n = A,T,C or G

<400> 449

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ccaagttcat gctntgtgct ggacgctgga cagggggcaa aagcnnttgc tcgtgggtca 60
ttctgancac cgaactgacc atgccagccc tgccgatggt cctccatggc tccctagtgc 120
cctggagagg agtgtcttag tcagagagta gtcctggaag gtggcctctg ngaggagcca 180
cggggacagc atcctgcaga tggtcgggcg cgtcccattc gccattcagg ctgcgcaact 240
gttgggaagg gcgatcgggt cgggcctctt cgctattacg ccagctggcg aaaggggat 300
gtgctgcaag gcgattaagt tgggtaacgc cagggttttc ccagtcncga cgttgtaaaa 360
cgacggccag tgaattgaat ttaggtgacn ctatagaaga gctatgacgt cgcattgcacg 420
cgtacgtaag cttggatcct ctagagcggc cgcctactac tactaaattc gcggccgcgt 480
cgacgtggga tcncactga gagagtggag agtgacatgt gctggacnct gtccatgaag 540
cactgagcag aagctggagg cacaacgcnc cagacactca cagctactca ggaggctgag 600
aacaggttga acctgggagg tggaggttgc aatgagctga gatcaggccn ctgcncacca 660
gcatggatga cagagtgaaa ctccatctta aaaaaaaaaa aaaaaa 706
```

<210> 450

<211> 493

<212> DNA

<213> Homo sapiens

<400> 450

```
gagacggagt gtcactctgt tgcccaggct ggagtgcagc aagacactgt ctaagaaaaa 60
acagttttta aaggtaaaac aacataaaaa gaaatatcct atagtggaaa taagagagtc 120
aaatgaggct gagaacttta caaagggatc ttacagacat gtcgccaata tcaactgcatg 180
agcctaagta taagaacaac ctttggggag aaaccatcat ttgacagtga ggtacaattc 240
caagtcagggt agtgaaatgg gtggaattaa actcaaatta atcctgccag ctgaaacgca 300
agagacactg tcagagagtt aaaaagttag ttctatccat gaggtgattc cacagtcttc 360
tcaagtcaac acatctgtga actcacagac caagttctta aaccactggt caaactctgc 420
tacacatcag aatcacctgg agagctttac aaactcccat tgccgagggg cgacgcggcc 480
gcgaatttag tag 493
```

<210> 451

<211> 501

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(501)

<223> n = A,T,C or G

<400> 451

```
gggcgcgtcc cattcgccat tcaggctgcg caactgttgg gaagggcgat cgggtcggggc 60
ctcttcgcta ttacgccagc tggcgaaagg gggatgtgct gcaaggcgat taagttgggt 120
aacgccaggg ttttcccagt cncgacgttg taaaacgacg gccagtgaat tgaatttagg 180
tgacnctata gaagagctat gacgtcgcat gcacgcgtac gtaagcttgg atcctctaga 240
gcggccgcct actactacta aattcgcgcc cgcgtcgacg tgggatccnc actgagagag 300
tggagagtga catgtgctgg acnctgtcca tgaagcactg agcagaagct ggaggcacia 360
cgcncacagc actcacagct actcaggagg ctgagaacag gttgaacctg ggaggtggag 420
gttgcaatga gctgagatca ggccnctgcn ccccgacatg gatgacagag tgaaactcca 480
```

tcttaaaaaa aaaaaaaaaa a

501

<210> 452

<211> 51

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(51)

<223> n = A,T,C or G

<400> 452

agacggtttc accnttaca cnccttttag gatgggnntt ggggagcaag c

51

<210> 453

<211> 317

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(317)

<223> n = A,T,C or G

<400> 453

tacatcttgc tttttcccca ttggaactag tcattaaccc atctctgaac tggtagaaaa 60
acatctgaag agctagtcta tcagcatctg gcaagtgaat tggatggttc tcagaacctat 120
ttcacccana cagcctgttt ctatcctgtt taataaatta gtttgggttc tctacatgca 180
taacaaaccc tgctccaatc tgtcacataa aagtctgtga cttgaagttt antcagcacc 240
cccaccaaac tttatttttc tatgtgtttt ttgcaacata tgagtgtttt gaaaataagg 300
taccatgtc tttatta 317

<210> 454

<211> 231

<212> DNA

<213> Homo sapiens

<400> 454

ttcgaggtag aatcaactct cagagtgtag tttccttcta tagatgagtc agcattaata 60
taagccacgc cacgctcttg aaggagtctt gaattctcct ctgctcactc agtagaacca 120
agaagaccaa attcttctgc atcccagctt gaaacaaaa ttgttcttct aggtctccac 180
ccttcctttt tcagtgttcc aaagctcctc acaatttcat gaacaacagc t 231

<210> 455

<211> 231

<212> DNA

<213> Homo sapiens

<400> 455

taccaaagag ggcataataa tcagtctcac agtaggggttc accatcctcc aagtgaaaaa 60
cattgttccg aatgggcttt ccacaggcta cacacacaaa acaggaaaca tgccaagttt 120
gtttcaacgc attgatgact tctccaagga tcttcctttg gcatcgacca cattcagggg 180
caaagaattt ctcatagcac agctcacaat acagggtctc tttctcctct a 231

<210> 456

<211> 231

<212> DNA

<213> Homo sapiens

<400> 456

```
ttggcaggta cccttacaaa gaagacacca taccttatgc gttattaggt ggaataatca 60
ttccattcag tattatcggt attattcttg gagaaaccct gtctgtttac tgtaaccttt 120
tgcactcaaa ttcctttatc aggaataact acatagccac tatttacaaa gccattggaa 180
cctttttatt tgggtgcagct gctagtcagt ccttgactga cattgccaag t 231
```

<210> 457

<211> 231

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(231)

<223> n = A,T,C or G

<400> 457

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cgaggtaccc aggggtctga aaatctctnn tttantagtc gatagcaaaa ttgttcatca 60
gcattcctta atatgatctt gctataatta gatTTTTctc cattagagtt catacagttt 120
tatttgattt tattagcaat ctctttcaga agacccttga gatcattaag ctttgtatcc 180
agttgtctaa atcgatgcct catttcctct gaggtgtcgc tggcttttgc g 231
```

<210> 458

<211> 231

<212> DNA

<213> Homo sapiens

<400> 458

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aggtctggtt cccccactt ccactccct ctactctctc taggactggg ctgggccaag 60
agaagagggg tggttaggga agccgttgag acctgaagcc ccacctcta ccttccttca 120
acaccctaac cttgggtaac agcatttgga attatcattt gggatgagta gaatttccaa 180
ggtcctgggt taggcatttt ggggggcccag accccaggag aagaagattc t 231
```

<210> 459

<211> 231

<212> DNA

<213> Homo sapiens

<400> 459

```
ggtaccgagg ctgctgaca cagagaaacc ccaacgcgag gaaaggaatg gccagccaca 60
ccttcgcgaa acctgtggtg gcccaccagt cctaacggga caggacagag agacagagca 120
gccctgcact gttttccctc caccacagcc atcctgtccc tcattggctc tgtgctttcc 180
actatacaca gtcaccgtcc caatgagaaa caagaaggag caccctccac a 231
```

<210> 460

<211> 231

<212> DNA

<213> Homo sapiens

<400> 460

gcagggtataa catgctgcaa caacagatgt gactaggaac ggccggtgac atggggaggg 60
cctatcaccc tattcttggg ggtgcttct tcacagtgt catgaagcct agcagcaaat 120
cccacctccc cacacgcaca cggccagcct ggagcccaca gaagggtcct cctgcagcca 180
gtggagcttg gtccagcctc cagtcacccc ctaccaggct taaggataga a 231

<210> 461

<211> 231

<212> DNA

<213> Homo sapiens

<400> 461

cgaggtttga gaagctctaa tgtgcagggg agccgagaag caggcggcct agggaggggc 60
gctgtgctc cagaagagtg tgtgcatgcc agaggggaaa caggcgcctg tgtgtcctgg 120
gtggggttca gtgaggagtg ggaaattggt tcagcagaac caagccgttg ggtgaataag 180
agggggattc catggcactg atagagccct atagtttcag agctgggaat t 231

<210> 462

<211> 231

<212> DNA

<213> Homo sapiens

<400> 462

aggtaccctc attgtagcca tgggaaaatt gatgttcagt ggggatcagt gaattaaatg 60
gggtcatgca agtataaaaa ttaaaaaaaaa aagacttcac gcccaatctc atatgatgtg 120
gaagaactgt tagagagacc aacagggtag tgggttagag atttccagag tcttacattt 180
tctagaggag gtatttaatt tcttctcact catccagtgt tgtatttagg a 231

<210> 463

<211> 231

<212> DNA

<213> Homo sapiens

<400> 463

tactccagcc tgggtgacaga gcgagaccct atcacccccc cccaccccac caaaaaaaaa 60
actgagtaga cagggtgcct cttggcatgg taagtcttaa gtcccctccc agatctgtga 120
catttgacag gtgtcttttc ctctggacct cgggtgtccc atctgagtga gaaaaggcag 180
tggggagggtg gatcttccag tcgaagcggc atagaagccc gtgtgaaaag c 231

<210> 464

<211> 231

<212> DNA

<213> Homo sapiens

<400> 464

gtactctaag attttatcta agttgccttt tctgggtggg aaagtttaac cttagtgact 60
aaggacatca catatgaaga atgtttaagt tggagggtggc aacgtgaatt gcaaacaggg 120
cctgtctcag tgactgtgtg cctgtagtcc cagctactcg ggagtctgtg tgaggccagg 180
ggtgccagcg caccagctag atgctctgta acttctaggc cccattttcc c 231

<210> 465

<211> 231

<212> DNA

<213> Homo sapiens

<400> 465

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catgttggtg tagctgtggt aatgctggct gcattctcaga cagggttaac ttcagctcct 60
gtggcaaat agcaacaaat tctgacatca tatttatggt ttctgtatct ttgttgatga 120
aggatggcac aatttttgct tgtgttcata atatactcag attagttcag ctccatcaga 180
taaactggag acatgcagga cattagggtg gtgtttagc tctggtaatg a 231

```

<210> 466

<211> 231

<212> DNA

<213> Homo sapiens

<400> 466

```

caggtaacctc tttccattgg atactgtgct agcaagcatg ctctccggg tttttttaat 60
ggccttcgaa cagaacttgc cacataccca ggtataatag tttctaacat ttgccagga 120
cctgtgcaat caaatattgt ggagaattcc ctagctggag aagtcacaaa gactataggc 180
aataatggag accagtcacca caagatgaca accagtcggt gtgtgaggct g 231

```

<210> 467

<211> 311

<212> DNA

<213> Homo sapiens

<400> 467

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gtacaccctg gcacagtcca atctgaactg gttcggcact catctttcat gagatggatg 60
tggcggcttt tctccttttt catcaagact cctcagcagg gagccagac cagcctgcac 120
tgtgccttaa cagaaggctc tgagattcta agtgggaatc atttcagtga ctgtcatgtg 180
gcatgggtct ctgcccaagc tcgtaatgag actatagcaa ggcggctgtg ggacgtcagt 240
tgtgacctgc tgggcctccc aatagactaa caggcagtgc cagttggacc caagagaaga 300
ctgcagcaga c 311

```

<210> 468

<211> 3112

<212> DNA

<213> Homo sapiens

<400> 468

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aagatctgca tgggtggaag gacctgatga tacagagttt gataggagac aattaaaggc 120
tggaaggcac tggatgcctg atgatgaagt ggactttcaa actggggcac tactgaaacg 180
atgggatggc cagagacaca ggagatgagt tggagcaagc tcaataacaa agtggttcaa 240
cgaggacttg gaattgcatg gagctggagc tgaagttag cccaattgtt tactagttga 300
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atttgaagga tgaattgaga taatttattt cagggtgccta gaacaatgcc cagattagta 480
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gattatcatt caatctcata gttttgtcat ggcccaattt atcctcactt gtgcctcaac 600
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tagtacatct ttcttatggg atgcacttat gaaaaatggg ggctgtcaac atctagtcac 1200

```



```

tttagctctc aaaatgggtc attttaagag aaagttttag aatctcatat ttattcctgt 1260
ggaaggacag cattgtggct tggactttat aaggctctta ttcaactaaa taggtgagaa 1320
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tttgtccttg tagttaattg aaagaaatag ggcactcttg tgagccactt taggggtcac 3060
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```

<210> 469

<211> 2229

<212> DNA

<213> Homo sapiens

<400> 469

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agctctttgt aaattcttta ttgccaggag tgaaccctaa agtggctcac aagagtggcc 60
tatttctttc aattaactac aaggacaaac acatctcaaa gttgagataa gtgaccagta 120
tgatttgcca aaattctaaa gcgcactcac catgaaatgg ataaaggtta cctttgggga 180
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aacgtgcccc ataaacattc cctctgtggc tcttgcatct catatattta tctaaactct 360
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agatgcttcc cagcctgttc acagatcccc tgggccagaa cactccttag gaaaaacagt 1020
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ggtcacctga ggtcaggagt tcaagaccag cctggccaat atggtgaaac cccatctcta 2160
ctaaaaatag aaaaattagc tgggcgtgct ggtgcatgcc tgtaatccca gcccacacac 2220
aatggaatt
2229

```

<210> 470

<211> 2426

<212> DNA

<213> Homo sapiens

<400> 470

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gtaaattctt tattgccagg agtgaaccct aaagtggctc acaagagtgc cctatttctt 60
tcaattaaact acaaggacaa acacatctca aagttgagat aagtgaccag tatgatattgc 120
caaaattcta aagcgcactc accatgaaat ggataaaggt tacctttggg gatttgcact 180
gcatgaattc tgtgaaaagc ttgttgagata ttgtgataga gatagagaaa tgaagtatat 240
tatataagat actatgaggt tccctgcctt tgcttcacat cccaggctta caaacgtgcc 300
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2426

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<211> 812

<212> DNA

<213> Homo sapiens

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